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- Low-odor latex for paper coatings
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The Paper Industry

Publishers of PAPER AND PULP MILL CATALOGUE

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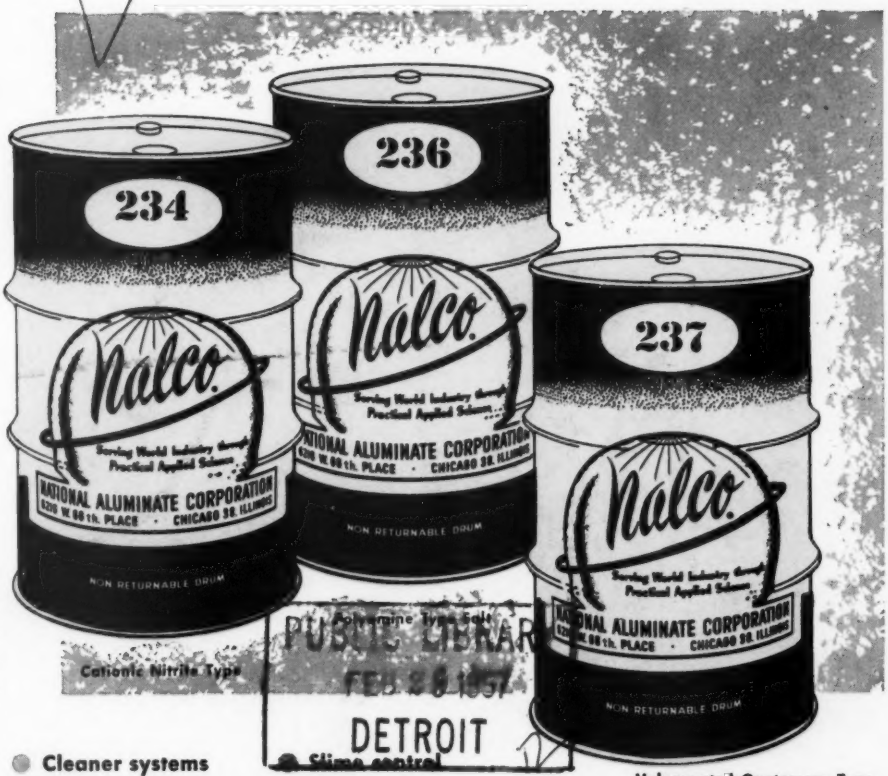

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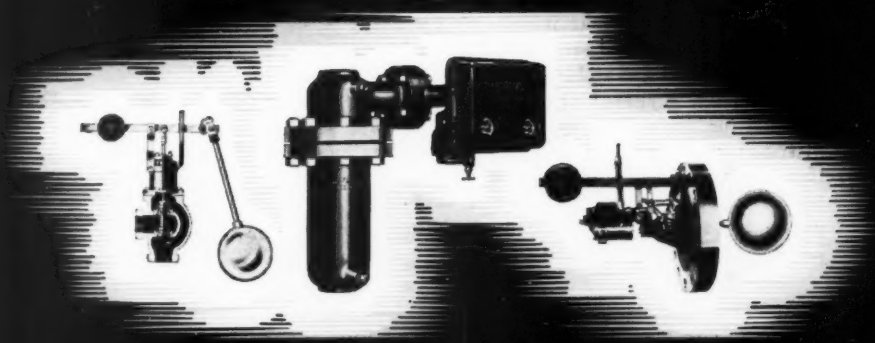

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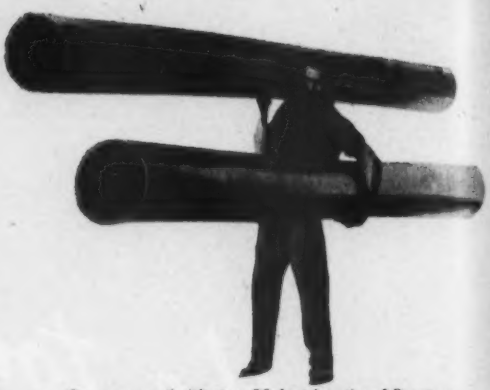
(POLYVINYL CHLORIDE PLASTIC FOR PAPER MILL APPLICATIONS)



One man easily lifts two 20-foot lengths of Ryertex-Omicron PVC pipe 14" in diameter—proof of the amazing lightness that makes this corrosion resistant plastic easy to handle and install.

New booklet shows how this remarkable plastic solves tough corrosion problems

If your operation involves any corrosive element, it will pay you to get this new booklet on Ryertex-Omicron PVC . . . and investigate the 20-year record of the plastic that won't corrode, rot or "age." Here's what the booklet includes:

Data on properties—More than 280 commonly encountered corrosive solutions and gases to which Ryertex-Omicron PVC is resistant are listed in a table showing concentrations and temperatures. Advantages such as non-support of combustion, non-magnetic and non-sparking properties and low flow resistance are detailed. Maximum operating pressures of all sizes of Ryertex-Omicron PVC pipe are given and their weight per foot listed. (The plastic weighs only 1/6 as much as steel—½ as much as aluminum.) In short, the booklet answers hundreds of questions about how Ryertex-Omicron PVC may solve your toughest corrosion problems.

Injection molded globe valve of Ryertex-Omicron PVC. The same smooth finish on the inside assures maximum flow.

Typical applications—The ability of Ryertex-Omicron PVC to withstand temperatures of 165° F. in continuous service make it suitable for many applications previously barred to plastics. Moreover, it can be formed and welded as readily as metal. In paper mills, Ryertex-Omicron PVC is recommended for: Pulp lines, chlorine lines, chlorine gas distributors, white water tanks, sizing tanks, head boxes, troughs, flow boxes and baffles, blowers, heater linings, fan housings, wet side bars and girths, trays and pulp measuring devices—to name just a few of many applications.

Forms and sizes available—Rigid non-plasticized Ryertex-Omicron PVC.

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The Paper Industry

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The PAPER INDUSTRY is indexed regularly in **Engineering Index** and **Industrial Arts Index.** An index to each volume is issued annually by the publisher as a part of the April number.

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From our point of view . .

Why a senior scientists' program?

A company's interests are best served by retaining its best scientists in the laboratory. This is especially true with the present return to a keener competition and the general concern about the scientific manpower shortage.

The exodus of scientists from the laboratory into administrative work must be stopped. We must take away the pressure or incentive that compels the top research man to exchange his important research activities for an administrative position.

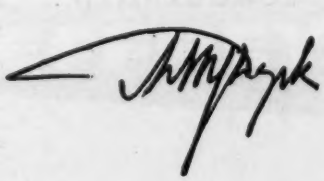
This does not mean that all scientists should remain in the laboratory. On the contrary, if a scientist shows exceptional administrative or executive talents, in addition to his professional accomplishments, he very often can be of greatest help to the company in an administrative or executive position where his technical or engineering background makes him ideally suited for an over-all coordination of the company's industrial effort. Evidence to this effect is all around us.

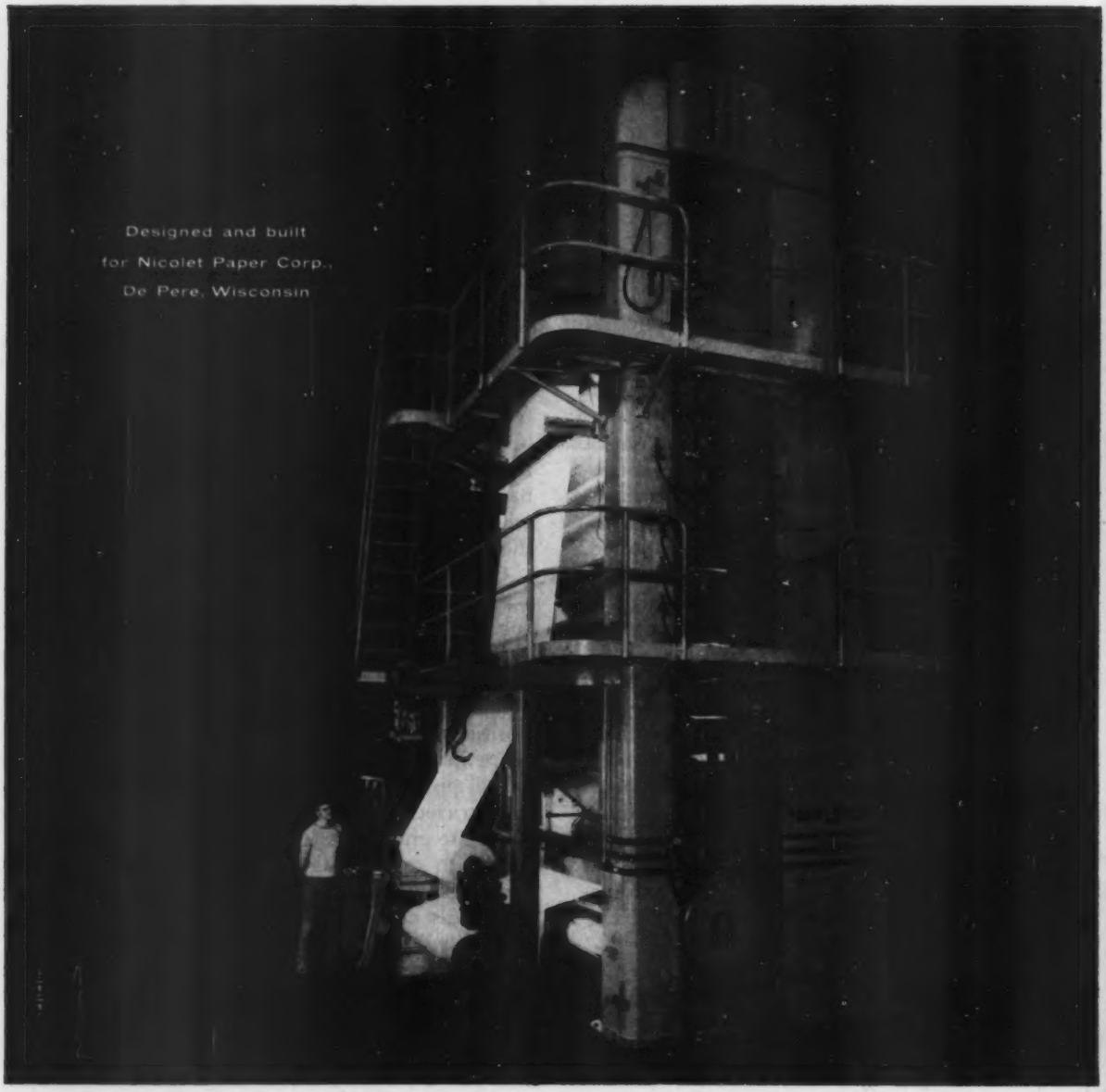
A senior scientists' program implies that the scientist, especially one who has no inclination for administrative work, should be permitted to stay in the laboratory without sacrifice of prestige or remuneration and with equal opportunities for general advancement. He should have a choice of parallel opportunities in either managerial or professional activities, depending on his inclinations and the best interests of the company.

It is only common sense that the man who is most intimately familiar with the technical fundamentals of the company's basic process, or who is instrumental in providing the ideas for the company's continued growth, should have equal opportunities—in every respect—with the man who is making his career in the administrative field.

Quite a number of industrial establishments —especially in the chemical industry—have successfully adopted a senior scientists' program. Under this program, scientists with outstanding accomplishments receive incomes comparable with those for administrative positions. They are given wide latitude and scope in planning and implementing their research programs. They enjoy the privilege of unrestricted attendance at technical meetings. They are encouraged to maintain direct contact with top management and attend staff meetings.

If the senior scientists' program were more generally adopted, it would be the first decisively effective step toward an alleviation of the scientific manpower shortage. It would mean a fuller utilization of the available scientific manpower, it would tend to raise the quality of both the researcher and his research, it would attract more students to the field of science, and it would be a most convincing and conclusive answer of a free democracy to the challenge of an enforced mass-output of scientists as practiced by the U.S.S.R. and its satellites.





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Skill and experience have earned APPLETON MACHINE COMPANY the reputation for *leadership* with the pulp and paper industry. That's why APPLETON was chosen to build this 16 roll, 84" supercalender that sets the pace for glassine production efficiency.

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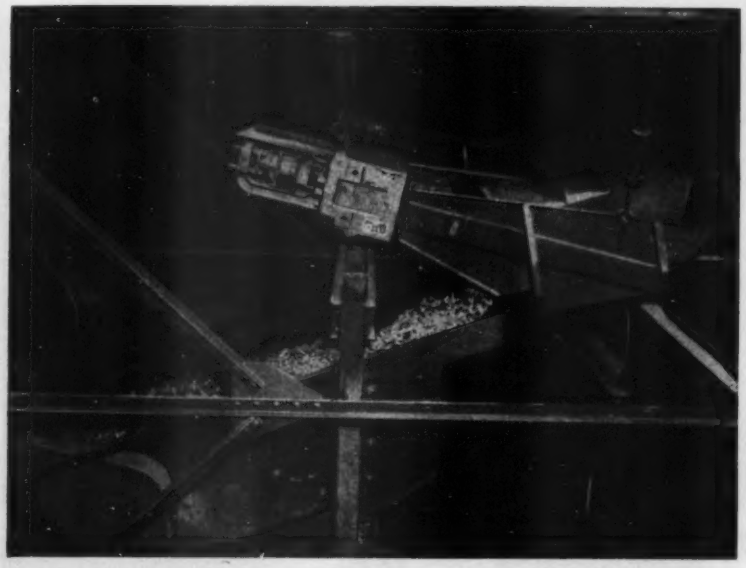
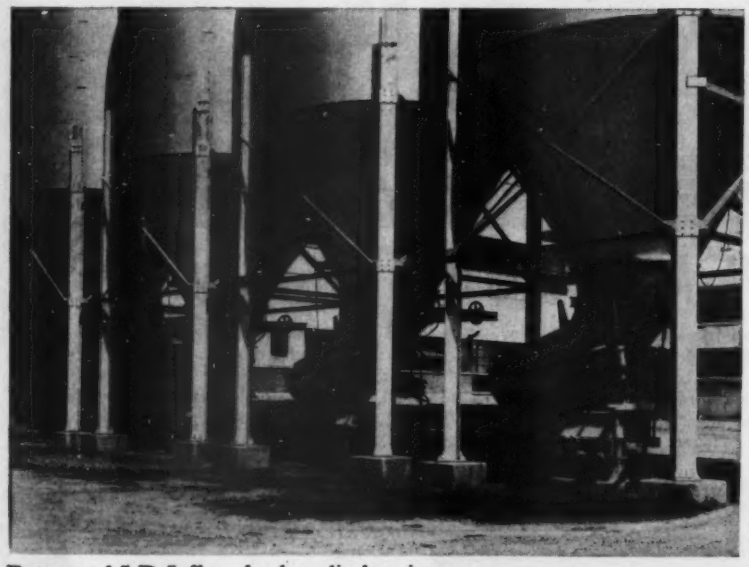
JEFFREY electric vibrating feeders transfer wood chips at an orderly, uniform rate



A pair of 54" by 4' Jeffrey pan feeders regulating flow of chips to screens.



Battery of 5-D Jeffrey feeders discharging chips from bins ahead of the digestors.

Jeffrey feeders are built in many types and capacities. With their great variety of accessory equipment, they can handle the many feeding operations required in the processing of pulpwood and in the manufacture of paper. They are also employed in weighing, batching and proportioning operations.

Rates of flow can be controlled manually or automatically, and can be varied while a unit is running. Response is positive and instantaneous. There are no wearing parts, so maintenance costs are low and there are no shut-downs for lubrication or replacement of parts.

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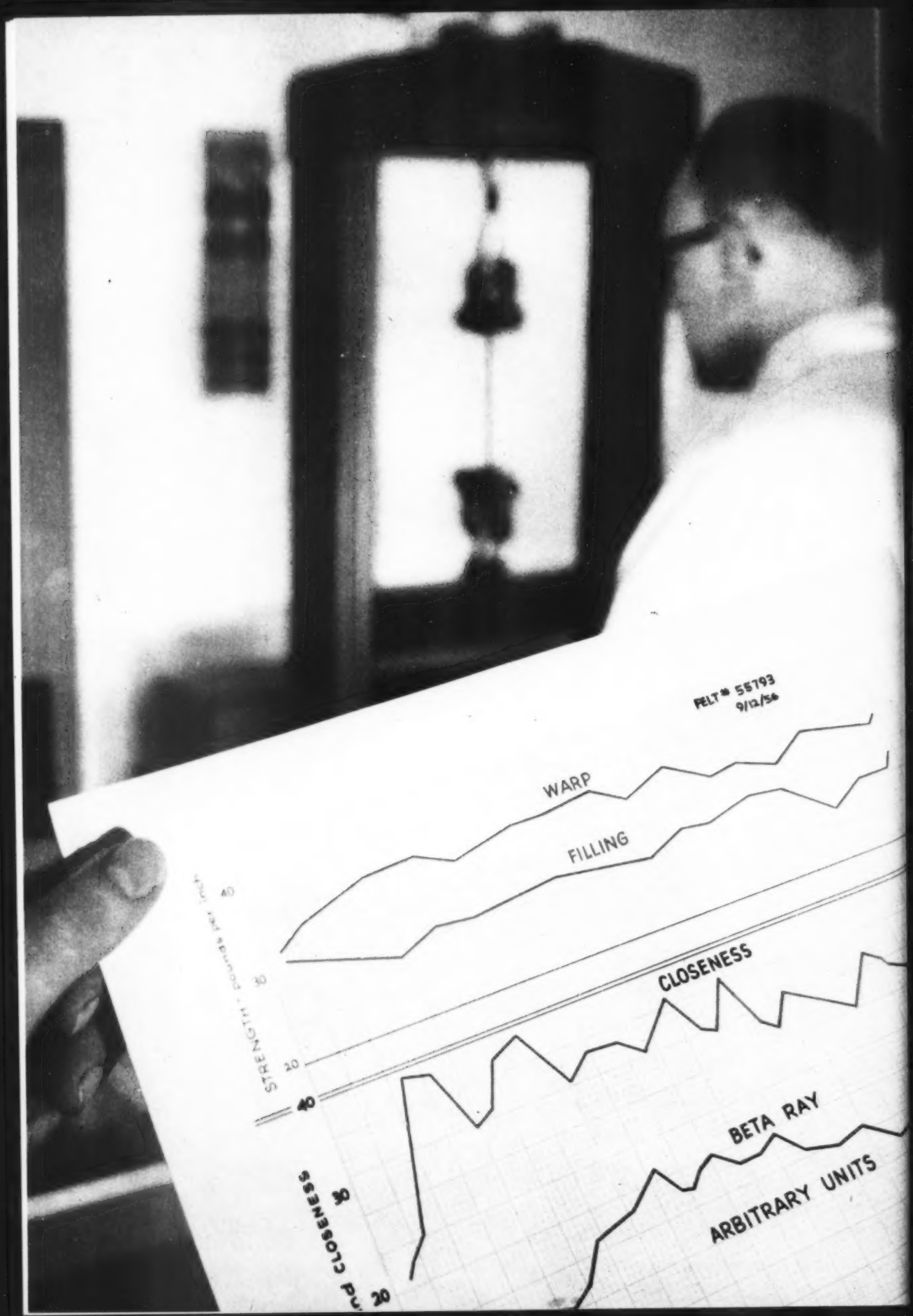
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for dependable, *precision* control of steam and air pressure

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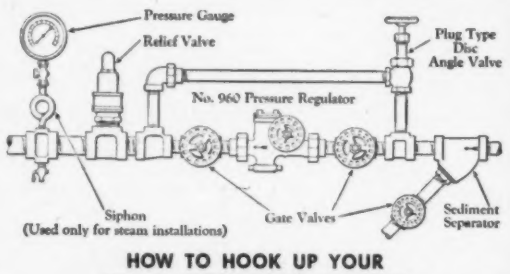

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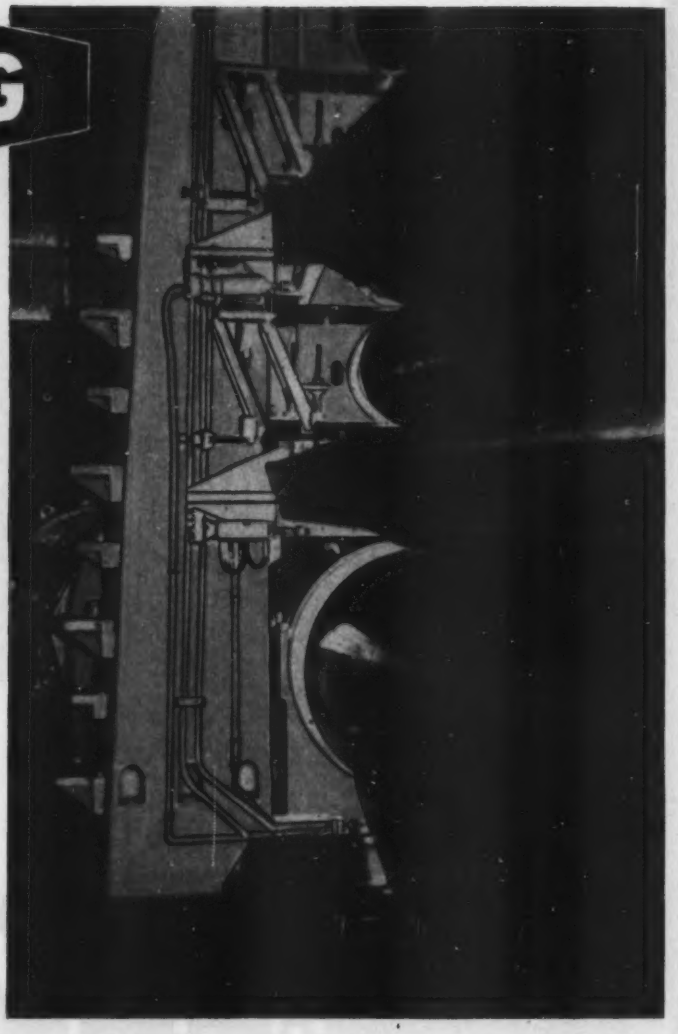

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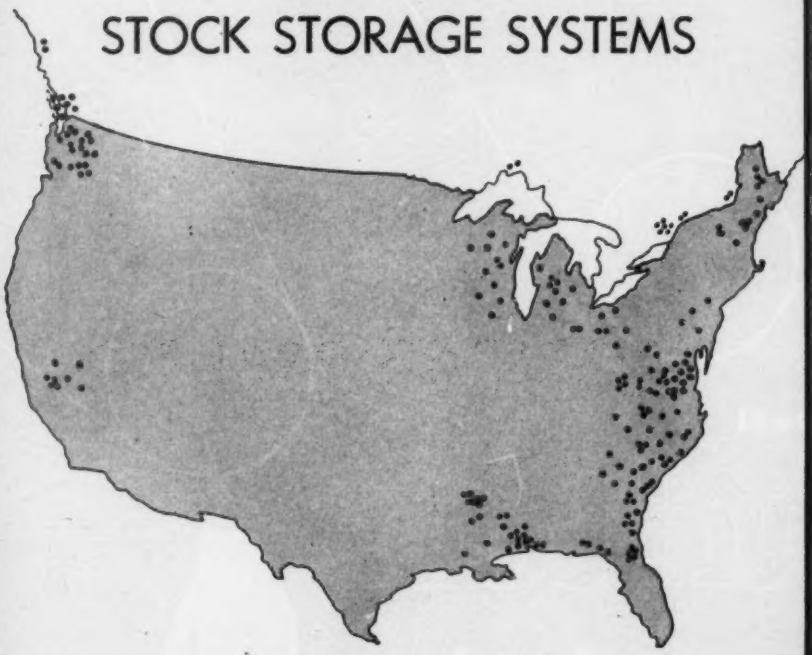

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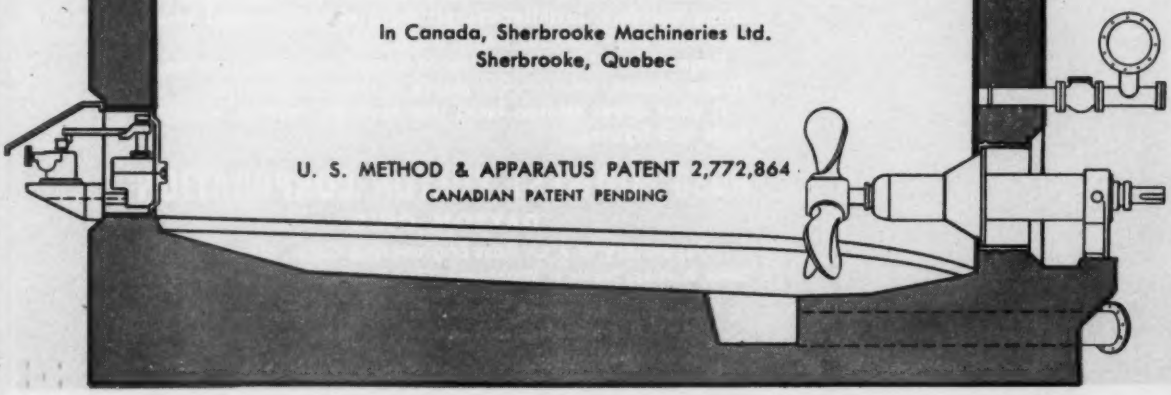

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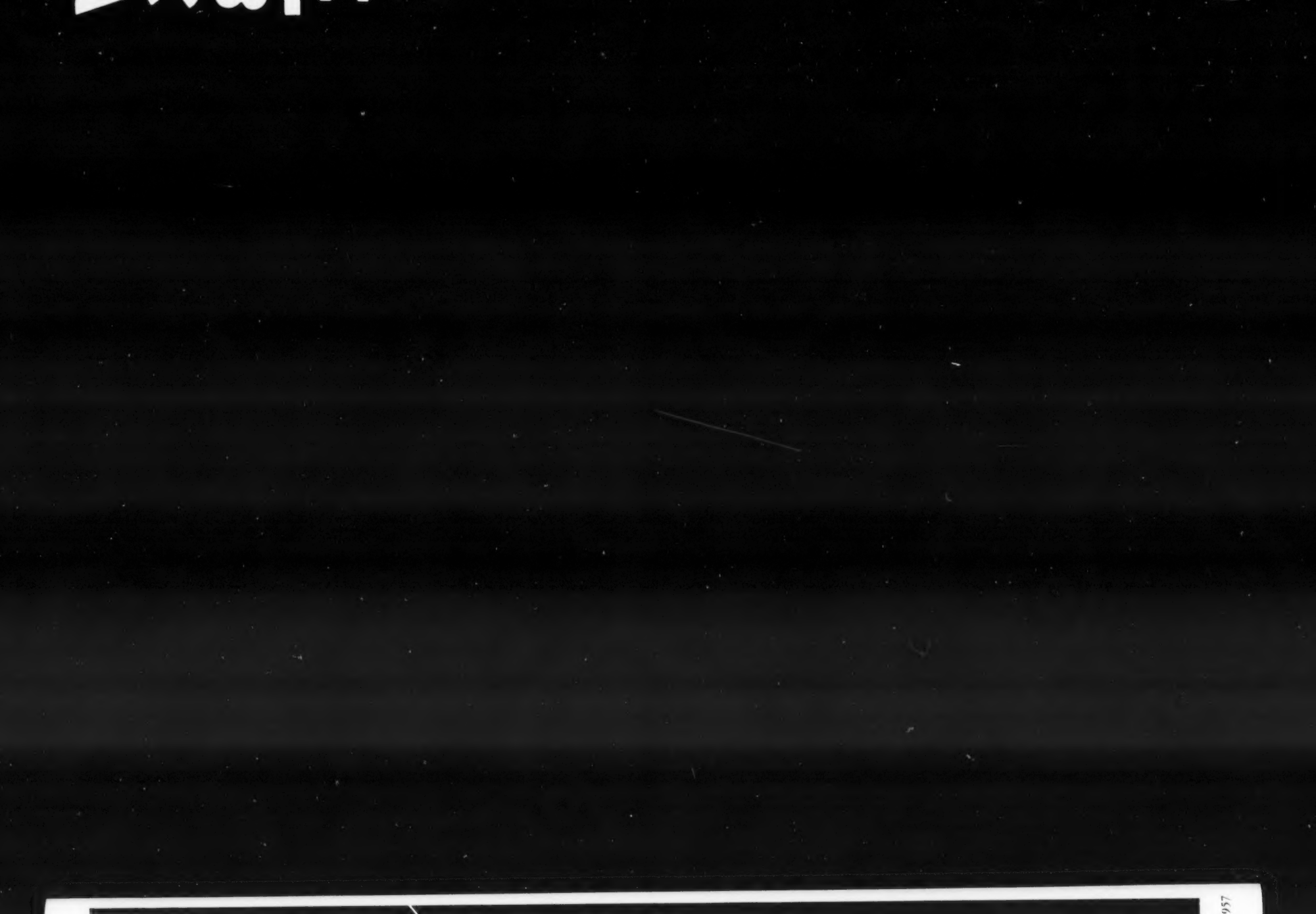

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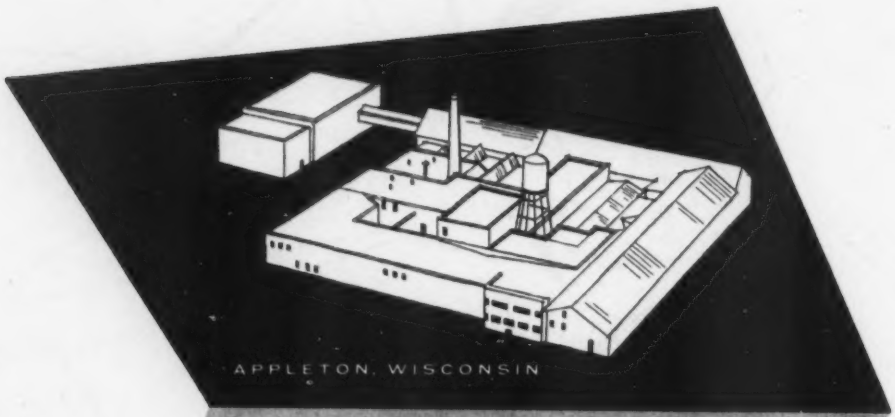

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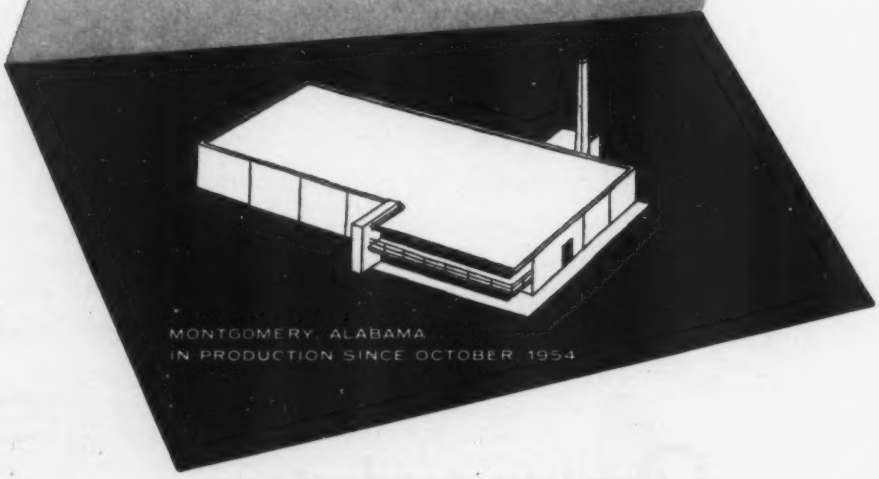

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AN IMPORTANT MESSAGE

to the customers and friends of Read Standard Corporation

Effective November 3, 1956, the Read Standard Corporation, 50-year-old manufacturer of Readco bakery and chemical processing equipment and Standardaire blowers, merged with and became a division of Capitol Products Corporation.

WHAT IS CAPITOL PRODUCTS CORPORATION?

Capitol Products Corporation is a young, progressive organization specializing in light metals fabrication. Principally, Capitol manufactures extruded aluminum products for the building industry. To date, this organization has enjoyed great success in both the manufacturing and marketing phases of its industry. For instance, in the highly competitive aluminum door business Capitol has become, in four years, the world's largest producer. This management now directs the Read Standard operation.

WHAT THIS MERGER MEANS TO YOU.

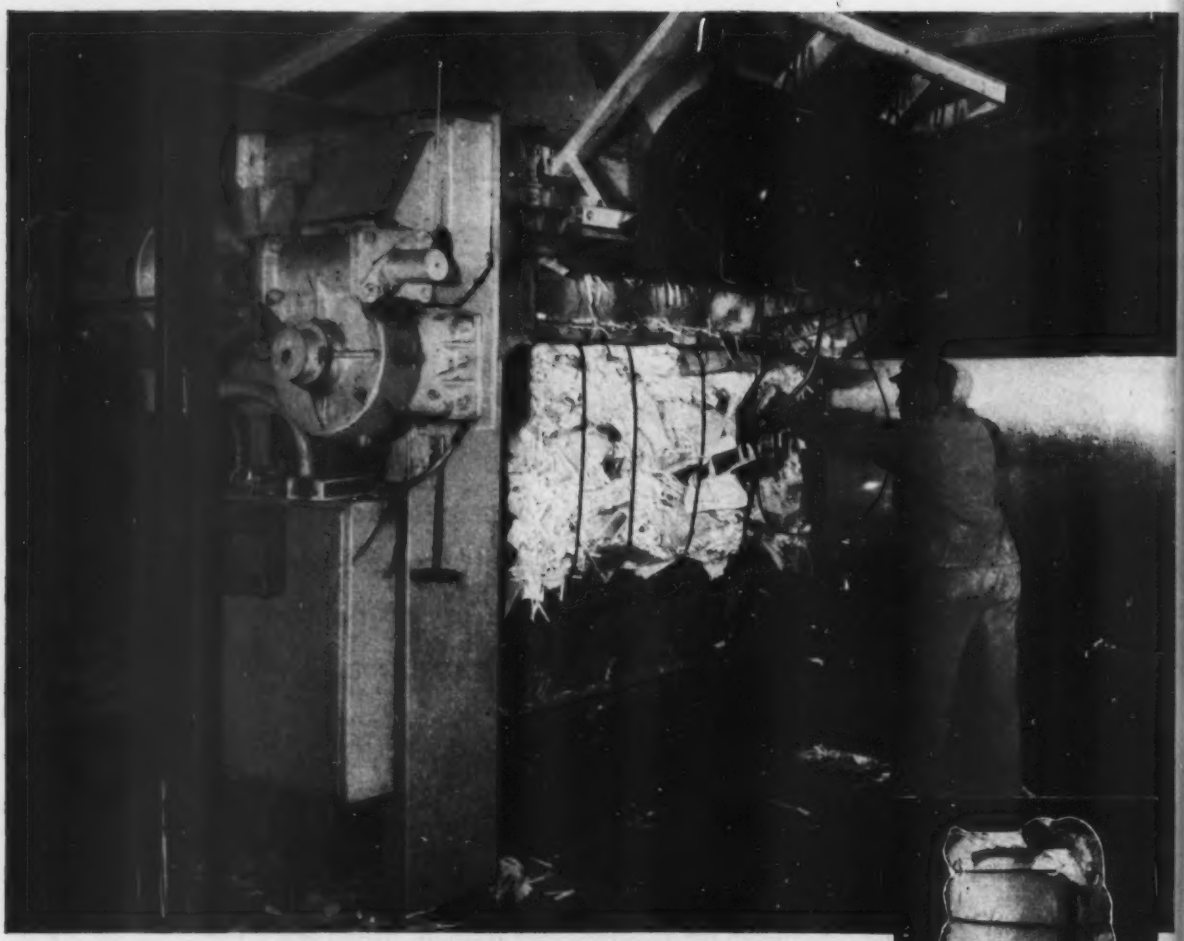
To you who know and have dealt with Read Standard, the merger means simply this . . . extensive research and development not only along present but completely new lines . . . broadened engineering, service and sales staffs to better handle your needs . . . and improved manufacturing facilities. As in the past, Read Standard will maintain office and plant operations at its location in York, Pa. Theodore F. Freed will be Vice President and Divisional Operations Manager of this Division.

To you whom we have served in the past, we wish not only to express our sincere appreciation but to affirm our policy. The prime objective of this Corporation is to make available to you the very best equipment and services that the ingenuity, modern research and manufacturing facilities of our combined operations can provide.

CAPITOL PRODUCTS CORPORATION

Eugene Gurkoff

Eugene Gurkoff
President



BALE WASTE PAPER?

New Signode way is faster, easier, cheaper, safer
. . . uses your present baling press!

Faster and *easier* because fewer ties are needed per bale; the inexpensive Signode setup eliminates waste motions of reaching, twisting, splicing; strapping feeds handily from conveniently located overhead dispensers.

Cheaper because bales are 29% denser, take 43% less strap per bale, save 25% of room in storage and in trucks; steel strapping stays tight, bales hold shape without bulging and wedging in transit; steel strapping itself can be unloaded from cars or trucks quickly and neatly with a lift truck.

Safer because flexible strap ends drop down, are easy to see; no sharp ends poke at man on receiving side; bales are squarer, firmer . . . safer and neater to handle, stack, load.

It's easy to change to this new method—now used by some of the biggest balers in the country. Signode fieldmen know how to adapt it to your present baling equipment . . . are ready to work with you now. If you bale waste paper or any other compressible material or product in any quantity, call the Signode man near you, or wire or write:

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2632 N. Western Avenue, Chicago 47, Illinois

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J. W. MILLER

Beloit Differential Drive Profitably applied both to machines making rag-content paper at several hundred feet per minute and wide, high-speed machines producing food-container board, corrugating medium, kraft paper, and newsprint. Over 300 units now running in the field. For details, please turn page.

BELOIT DIFFERENTIAL DRIVE

. . . holds steady draws mechanically, puts minimum strain on sheet, reduces breaks

A new approach to the problem of driving a paper machine was introduced in 1951 with the Beloit Differential Drive. Since all equipment, from fourdrinier through reel, is part of the same machine—not a group of separate machines—the various sections are geared together and rotate together at all times. Each roll forms and processes the web in perfect synchronization with all other rolls, thus establishing an almost perfect draw between sections of the machine.

This fixed ratio between all sections is achieved by a machine-floor-mounted line-shaft extending from couch to reel. A turbine or electric motor near the center of the machine provides power for the line-shaft, driving the patented differential drive units at the drive points along the machine.

From the operator's point of view the Beloit Differential Drive gives unmatched control of draw conditions from panels conveniently located along the tending side of the machine. At his fingertips are controls for faster-slower, clutch and optional brake, with an added control at the calender and reel for slack take-up.

From the standpoint of the maintenance man the Beloit Differential Drive has the obvious advantage of requiring minimum attention during long, trouble-free performance. Differential-gear units and reduction-gear units are all lubricated automatically from a central oiling system, with an oil pump inside each differential unit as an additional safety factor. There

is no need for special technical training of maintenance crews, since the Drive uses standard types of shafting, gears, and bearings which are commonly found in the paper mill.

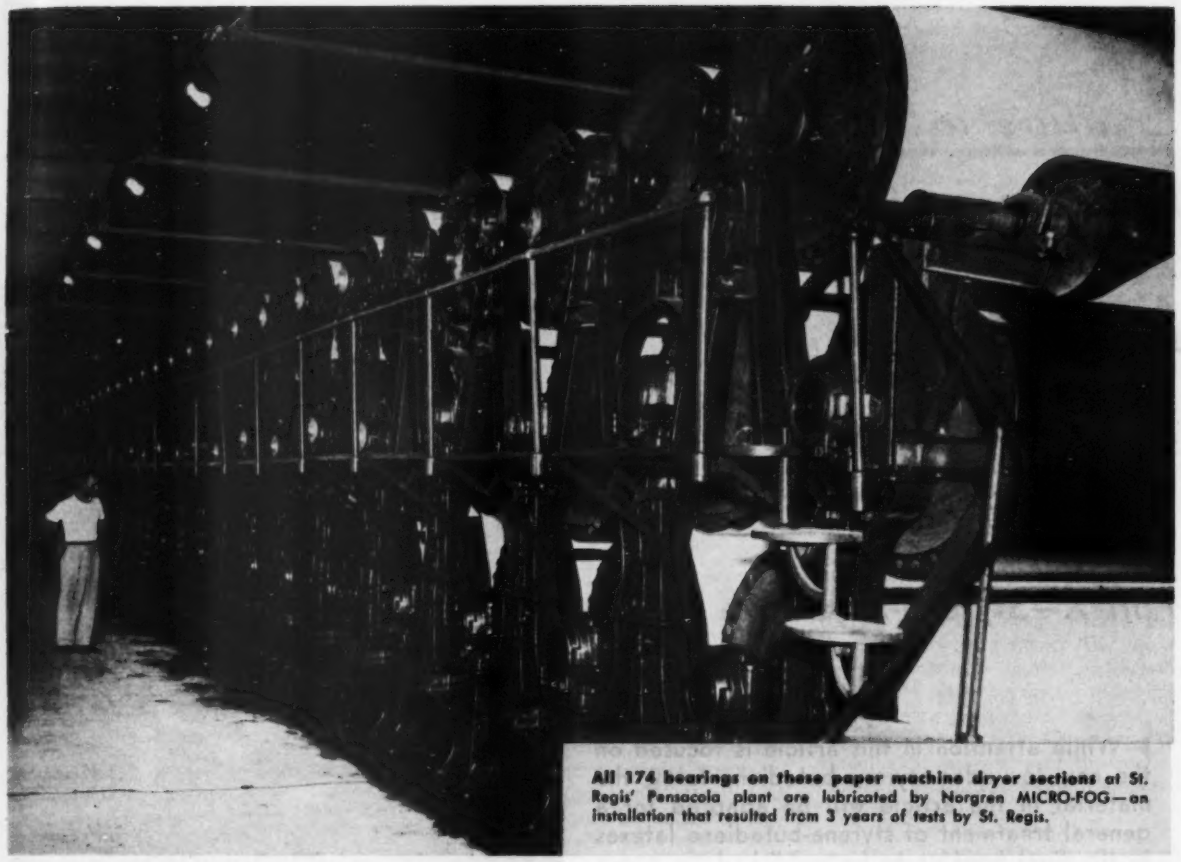
For the paper mill superintendent, the Beloit Differential Drive means higher quality paper and a minimum of production interruptions. Tests are higher because of more accurate, stable control of draws. Reduction of strain on the sheet likewise means that trim width of the finished sheet can be held more accurately than on a conventionally driven machine having equal wire width.

your partner in papermaking **BELOIT**

PAPER MACHINERY

BELOIT IRON WORKS · PAPER MACHINERY · BELOIT, WIS., U.S.A.

WHEN YOU BUY BELOIT . . . YOU BUY MORE THAN A MACHINE

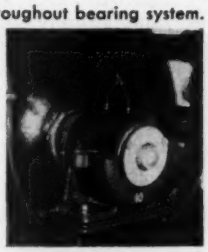


All 174 bearings on these paper machine dryer sections at St. Regis' Pensacola plant are lubricated by Norgren MICRO-FOG—an installation that resulted from 3 years of tests by St. Regis.

ST. REGIS PAPER CO. TESTS PROVE NORGREN MICRO-FOG LUBRICATION BEST

Results of three years of testing by St. Regis prove Norgren MICRO-FOG Lubrication on paper machine dryer sections best in every way...

1. Thoroughness of MICRO-FOG Lubrication is far superior—Delivery of oil is consistent throughout bearing system.
2. Maintenance of lubrication system greatly simplified—Eliminated periodic installation of grease blocks and hand oiling.
3. Bearing temperatures reduced—Heat reduction averaged 8° to 10° F.
4. Less lubricant is consumed—Ended frequent oil changes previously necessary due to discoloration and plastic-like formation.
5. Eliminated paper losses formerly caused by excessive lubrication.
6. Simple to install, easy to operate compared to circulating system.
7. Lint and other contaminants are excluded from bearings — MICRO-FOG system maintains positive pressure in bearing housings.



How MICRO-FOG distribution line enters a plain bearing.

For complete information about this application, call your nearby Norgren Representative listed in your telephone directory—or WRITE FOR BLUEPRINT MF-23.

MICRO-FOG by NORGREN

C. A. NORGREN CO.

3455 SOUTH ELATI STREET, ENGLEWOOD, COLORADO

Feature articles

Low-odor latex, for paper coatings

Part X—Styrene-butadiene latexes

While attention in this article is focused on the new low-odor styrene-butadiene latex, the material in the article will be adapted for a general treatment of styrene-butadiene latexes in the final booklet to be published on paper coatings.

Champion Machine Coater. (Courtesy: Mac Sim Bar Paper Co.)

A NEW LATEX developed by Dow Chemical Co. promises to find a wide and important application in the paper manufacturing industry.

Like Dow Latex 512-R, the new latex known as Latex 512-L is a styrene-butadiene latex. Both latexes have practically identical properties. The only significant property that sets the new latex off from Latex 512-R is its exceedingly low odor, which makes it a suitable coating ingredient in papers used for food packaging. When used as a coating, the film is clear, continuous, flexible, elastic and slightly tacky.

Latex 512-L has been tested and has shown good performance on both the Champion and multiple roll type machine coaters.

The latex can be used as a sole binder of pigments in coatings formulations. The use of an all-latex binder permits higher total solids in the formulation, which in turn results in heavier coating weights applied on the machine coaters. Thus, coatings containing 63 per cent solids have been found sufficiently fluid for use on a Champion coater which normally operates with coatings containing 40 per cent solids.

Latex 512-L is a styrene-butadiene latex with properties similar to those of Latex 512-R. Its low-odor property is a distinguishing characteristic that makes it a suitable coating ingredient in food packaging.

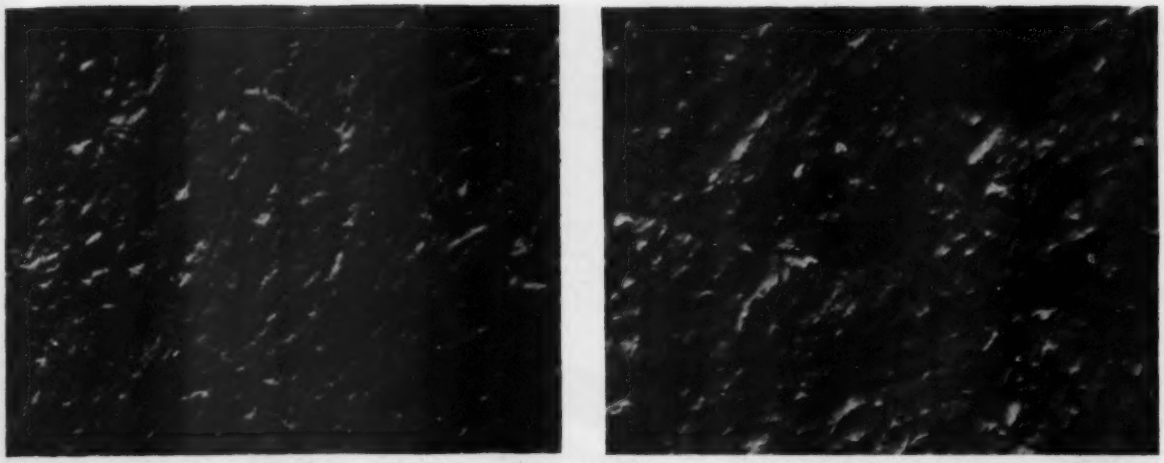
The all-latex binder also results in coatings with high gloss and exceptionally good printing properties.

All these properties make Latex 512-L an exceedingly suitable ingredient for boxboard coatings. Boxboard coating is becoming increasingly popular in view of the supermarkets' requirements for eye-catching displays of colored and lithographic prints on packaged goods.

Dow Latex 512-L can also be used as a low-odor pigment binder in pigmented breadwrap coatings, where it is used in quantities of 8-12 parts latex solids per 100 parts pigment solids. It is also suitable as a low-odor pigment binder for clay coatings in conjunction with starch and casein in the manufacture of fine printing papers where low odor properties are desirable.

Properties of Dow Latex 512-L

As already stated, the properties of Latex 512-L are similar to those of Latex 512-R, which has gained widespread acceptance as a paper coating adhesive in off-machine, machine and



Left—casein bound pigment coated board. Right— Dow Latex 512L bound pigment coated board. Both coatings were applied on a Champion Machine Coater. Magnification of photograph = 35×.

size press applications. The following table shows the physical properties of Dow Latex 512-L:

Per cent Solids by Weight	48 ± 1.0
Per cent Water by Weight	52 ± 1.0
Specific Gravity (25° C)	1.005
Weight per Gal. (lbs.)	8.4
Weight of Solids per Gal. (lbs.)	4.0
pH of Latex	10.5 ± 0.5
Viscosity-cps. at 25° C	10-12
Average Particle Size (microns)	0.2
Surface Tension (dynes per centimeter) at 25° C	36-39
Specific Gravity of Solids	1.01
Index of Refraction of Solids	1.5650
Styrene/Butadiene Ratio	60/40

Both Latex 512-L and Latex 512-R act as effective softeners and modifiers for proteins, which as is well known form hard and brittle films. The fact that the latex particles are somewhat thermoplastic results in a flow of pigment particles when the coatings are subjected to the heat and pressure of the supercalender. This property contributes to the increased smoothness and gloss of supercalendered, latex-coated paper.

In both latexes, flexibility is a built-in property and does not depend on the presence of moisture. Another important property is the fact that latex particles, because of their hydrophobic nature, do not imbibe water. Consequently, they will not shrink on drying, and this imparts dimensional stability to the coating and results in less curl of the coated sheet.

The substitution of latex for protein in coating mixtures normally results in lowering the final viscosity, making possible the use of higher solids at comparable viscosities. Most formulations in which latex is used contain 25-65 per cent of the total adhesive as latex. Increasing the latex content above 65 per cent of the total adhesive results in marked improvements of water resistance and folding properties.

Since starch is hard and water-sensitive, the substitution of latex for starch has to be done to a much greater extent to effect comparable changes in properties. It is interesting to note that the maximum water resistance of latex starch coatings is not reached at once but increases during aging periods. Since starch does not act as a protective colloid for latexes, as do proteins, it is generally advisable to stabilize the latexes with 3 per cent protein (casein or isolated soya protein) based on latex solids.

The use of styrene-butadiene latexes in coatings is recommended for the manufacture of high-quality printing papers. Latex-coated papers exhibit a superior smoothness which makes possible an accurate reproduction of detail and color when printed both by letterpress and offset. The use of styrene-butadiene latexes in smaller quantities, when superior paper qualities are not desired, can also be advantageous, since it improves the rheological properties of the coating, thereby insuring a more trouble-free coating operation.

Test results with Latex 512-L

Tables I, II, III show gloss, opacity, and ink holdout test results made on commercial trial runs comparing casein and Latex 512-L as the sole binders in pigmented boxboard coatings. The coating formulation for these boxboard trial runs contained:

(Continued on page 942)

Table I—Results of Gloss Test on Boxboard Samples

Binder Identification	No. of Tests	(% Reflectance of 60° Incident Beam) Max. Reading	Min. Reading	Average Reading
Casein	10	10.5	8.5	9.1
Latex 512-L	10	23.0	15.0	17.8

Table II—Opacity Test Results

Binder Identification	No. of Tests	(% Reflectance at 560 μ) Max. Reading	Min. Reading	Average Reading
Latex 512-L	3	100%	100%	100%
Casein	3	100%	100%	100%

Table III—K & N Ink Holdout Test Results

Binder Identification	No. of Tests	(% Reflectance at 580 μ) Max. Reading	Min. Reading	Average Reading
Latex 512-L	2	57.0	56.5	56.8
Casein	2	53.6	54.4	54.0

Air-view of the new 150-ton capacity paperboard mill.

New U. S. Gypsum mill incorporates many novel design features

The new 150-ton capacity paperboard mill is streamlined and operated largely from electronic control panels; the high-quality board is used for conversion into Sheetrock, Rocklath, and sheathing board.

THE NEW United States Gypsum Co. paperboard mill that went into production at Galena Park, Texas, early in 1956 is one of the most modern paperboard mills in the world. It features some of the most automatically-operated installations of their kind. With the completion of this plant, the company has added another unit to the six paperboard mills already in operation.

The location of the mill in east Texas was dictated by the growing demand for U. S. Gypsum's products in the Southwest. The Galena Park mill is situated on a 30-acre site along the ship channel in the Houston Navigation District.

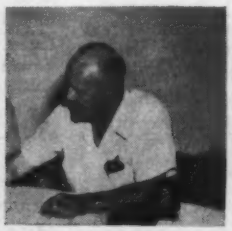
Basic plans for the mill and equipment were prepared by Clarence A. Carlson of Chicago Engineering; C. C. Thiel, the plant's works manager, and N. W. Cady, production manager of the paper division. The construction job was done by Brown & Root Inc., Houston contractors.

The entire manufacturing process is streamlined and largely operated from electronic control panels. The mill, a result of long and thoughtful planning, was completed in the record time of nine months.

C. C. Thiel
Works Manager

D. E. Galbraith
Quality Superintendent

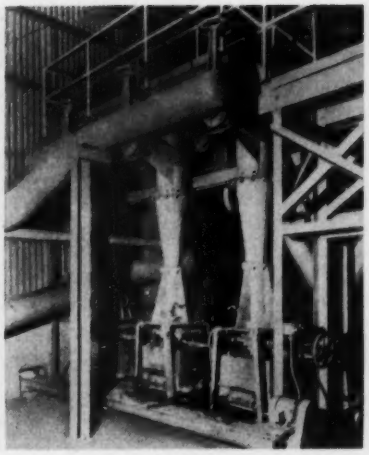
M. C. Musgrave
Paper Mill Superintendent



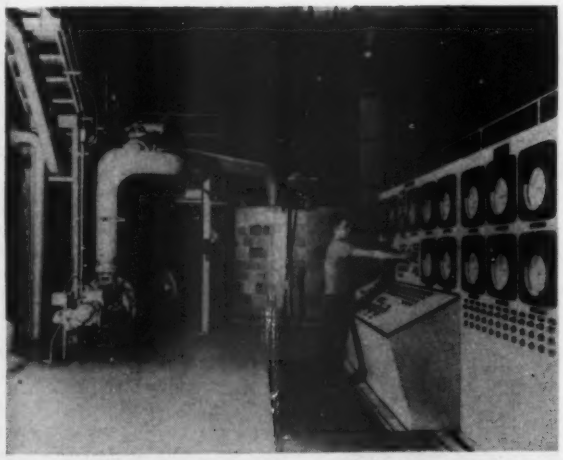
Harry Klehn
Engineering Superintendent

E. C. Morrow
Personnel Superintendent

View of the 20-ft. and the 14-ft. Black-Clawson Hydrapulpers.

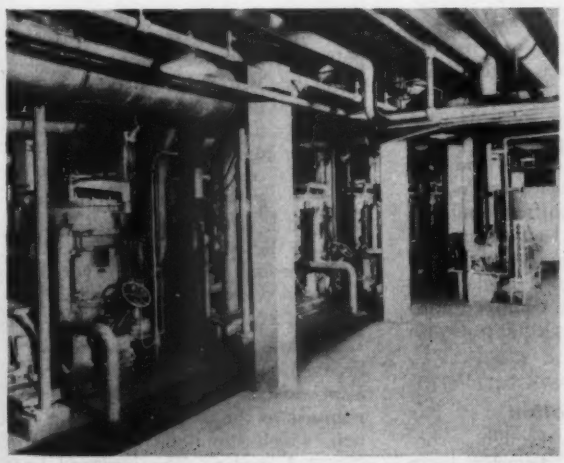


View of the Black-Clawson Liquid Cyclones in the filler stock system.



The Black-Clawson Duo-Cycling system includes two vertical chests, a No. 4 Hydrafiner equipped with automatic plug adjuster, and control panel for complete automatic control.

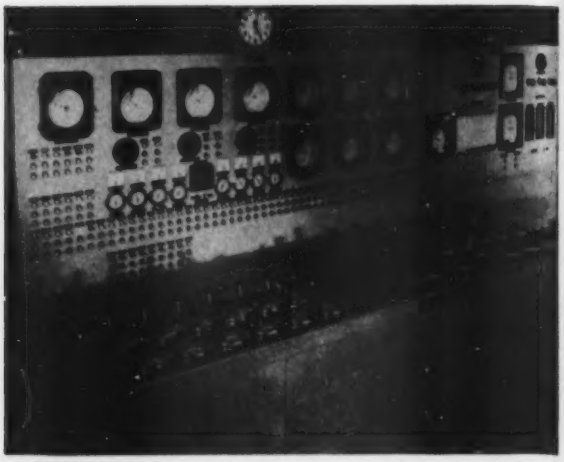
Five Black-Clawson No. 2 jordans—three on filler stock and two on liner stock; the jordans are fed through a loop system which eliminates the need for a jordan distributing box.



Eight Black-Clawson No. 24P Selectifier screens are used for final cleaning of both filler and liner stocks just ahead of the vats.

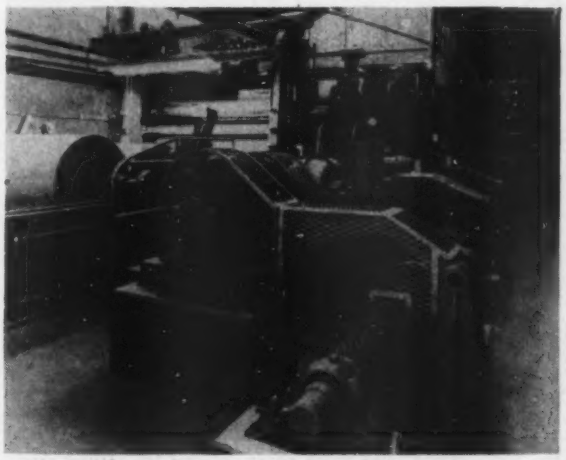
The eight-cylinder Black-Clawson paperboard machine has 48-in. diameter molds and five counter-flow and two Uni-flow vats equipped with air exhausters.

The Black-Clawson press section of the paper machine consists of four primary presses and two main presses.



The centralized control station for control of stock preparation, wet end and press section operations.

The two Black-Clawson calender stacks, Autoflyte 36 automatic reel, and No. 30 Milltype winder.



The Black-Clawson line shaft drive with spiral bevel gear and short center V-belt drive units.

The eight-cylinder paper machine is more than 400 ft. long. Its output of 150 tons per day is a high-quality board for conversion into Sheetrock, Rocklath, and sheathing board at company plants located at Sweetwater, Texas; New Orleans, La.; Jacksonville, Fla., and Sauthard, Okla.

The supervisory staff of the new mill includes: C. C. Thiel, works manager; D. E. Galbraith, quality superintendent; M. C. Musgrave, paper mill superintendent; Harry Klehn, plant engineering superintendent, and E. C. Morrow, personnel superintendent.

Raw materials and handling

The new mill uses 150-160 tons per day of four basic grades of wastepaper: (1) corrugated, (2) kraft cuttings, (3) mixed paper, and (4) newspaper. Additional requirements of sulfite and groundwood pulps are bought on the market.

All handling of raw materials as well as finished products in the warehouse is done by six trucks, four of which are of 4000-lb. capacity and two of 5000-lb. capacity. Two of the 4000-lb. capacity trucks and one of the 5000-lb. capacity trucks are equipped with side-shifters and rotating bale-handling clamps that have a range of 26-76 in. and can be rotated through a 360° angle. The other three trucks are equipped with side-shifters and forks equipped with rubber-faced backs.

Liner stock preparation

Wastepaper is fed through a conveyor into a 14-ft. diameter batch hydrapulper equipped with automatic control for water proportioning. Instrumentation here also includes a signal system to let the operator know when the machine is ready to receive pulp. The slushed liner stock goes from the hydrapulper to two cycling chests and one dump chest, as desired. All three chests are equipped with propeller agitators. This Duo-Cycling system is operated through complete automatic remote control from a control panel.

From the cycling chests, liner stock goes through a No. 4 hydrafiner, equipped with Duotrol automatic plug adjuster, to the dump chest.

Following the dump chest, it is brought to 4½-per cent consistency in consistency regulators and then pumped to the jordan liner loop system, which supplies two of the five No. 2-A jordans. The jordaned liner stock is then pumped to the jordan machine chest where size is added and

Principal equipment and suppliers at U. S. Gypsum

Stock Preparation System

Agitators, propeller type	Black-Clawson Co.
Brammer consistency regulators (4), Pandia type	Black-Clawson Co.
Cycling chests (2), tile-lined	Chemical Linings Inc.
Decker chest (1), tile-lined	Chemical Linings Inc.
Dump chest, tile-lined	Chemical Linings Inc.
Dump pump (1)	Black-Clawson Co.
Gyro-Flote (4), 50-ton per day capacity	Black-Clawson Co.
Hydrapulpers (2), one 20-ft. diameter continuous, one 14-ft. diameter batch type	Black-Clawson Co.
Hydrafiner (1), with Duotrol automatic plug adjuster and control panel for automatic control	Black-Clawson Co.
Instrumentation, automatic control of Hydrapulpers and signal system	Foxboro Co.
Jordans (6), No. 2-A	Black-Clawson Co.
Jordan loop pump (1)	Black-Clawson Co.
Jordan machine chest (1), tile-lined	Chemical Linings Inc.
Junk remover (1) automatic	Black-Clawson Co.
Liquid cyclones (3)	Black-Clawson Co.
Machine blending chests (2), tile-lined	Chemical Linings Inc.
Machine loop system, pressurized	Black-Clawson Co.
Ragger, continuous	Black-Clawson Co.
Regulating box (1), for level control in hydrapulper	Black-Clawson Co.
Thickeners (3), couch-type 48- by 120-in. molds	Black-Clawson Co.
White water tank (1), tile-lined	Chemical Linings Inc.

Machine Room

Calender stacks (2), one 8-roll, one 5-roll	Black-Clawson Co.
Circulating pumps (8), from cleaners to Selectifier screens	Black-Clawson Co.
Cleaners (14), eight 12-in. and six 6-in. secondaries	Bauer Bros. Co.
Cleaner pumps (8)	Black-Clawson Co.
Condenser, for heat recovery from dryer drainage system	Ross Midwest Fulton Corp.
Couch rolls (8), with airlift cylinders	Black-Clawson Co.
Cranes (3), one 5-ton capacity, two 1½-ton capacity	Lypta
Cylinder paperboard machine, 121 in. wide, 150-ton per day capacity, 48-in. diameter cylinder molds	Black-Clawson Co.
Cylinder vats (8), five counterflow, three Uniflo	Black-Clawson Co.
Drainage system, pressure cascading arrangement	Ross Midwest Fulton Corp.
Drive, sectional electric for cylinder machine, 11 dc gearmotors to individually drive first main press roll, primary presses, cylinder molds and suction return drum.	General Electric Co.
Drive, lineshaft, spiral bevel gear, short V-belt drive units	Black-Clawson Co.
Dryers (98), 48-in. diameter, mounted on framework of high-type design	Black-Clawson Co.
Felt conditioners, Vickery	E. D. Jones & Sons Co.
Felt washer and spreader (1), fixed bow, free wheeling expander roll type	Mount Hope Machinery Co.
Flowraters	Fischer & Porter Co.
Instrumentation, vertically- and horizontally-mounted panels controlling stock preparation and paper machine operation	Foxboro Co.
Lineshaft drive, 400-hp dc motor, amplidyne speed-regulated	General Electric Co.
Machine hood and vapor absorption system	Jamar-Olmen Co.
Press section, consisting of four primary presses and two main presses	Black-Clawson Co.
Reel (1), Autoflyte 36 automatic	Black-Clawson Co.
Rotameters	Brooks Rotameter Co.
Saveall (1), flotation type, 1200-gpm capacity equipped with double-disc inlet valve	Sveen-Pedersen Sales Corp.
Selectifier screens (8), No. 24 P	Black-Clawson Co.
Shower pipes, at whipper location	Sandusky Foundry & Machine Co.
Stuff boxes (8), supplying the cylinder vats	Black-Clawson Co.
Suction press rolls (3), rubber covered	Beloit Iron Works
Vacuum pumps (5)	Nash Engineering Co.
Winder (1), No. 30 Milltype	Black-Clawson Co.

Other equipment

Boilers (3), 30,000 lbs. steam per hour, 160-psi pressure, 3300 sq. ft. heating area each	Wickes Boiler Co.
Emulsifier, for sizes	Hercules Powder Co.
Fork trucks (6), four 400-lb. and two 500-lb. capacity	Yale & Towne Mfg. Co.
Indoor substations (3), 1000-kva each	General Electric Co.
Limitamp line-up, for the 4160-v motors	General Electric Co.
Motors, electric (280), stock preparation and machine room, 4160-v and 440-v ac	General Electric Co.
Motor control centers (12)	General Electric Co.
Pumps (93), stock preparation and machine room	Black-Clawson Co.

then through a consistency regulator to the machine blending chest and the pressurized loop system.

Filler stock preparation

In the filler stock system, waste-paper enters a 20-ft. diameter continuous Hydrapulper by way of a feed conveyor equipped with a variable speed drive. The Hydrapulper is equipped with a continuous ragger; a conveyor guillotine which cuts the rags in 10-ft. lengths, and an automatic junk remover which removes heavy junk, wet strength paper and wood. A regulating box automatically controls the level in the Hydrapulper.

The slushed filler stock is pumped from the Hydrapulper to three Liquid Cyclones, which separate all heavier-than-water material from the stock by centrifugal action.

There are four Gyro-Flote screens, of 50-ton daily capacity each, installed after the cyclones, which, however, can be by-passed if desired by routing the stock through a settling tank and then, in either case, to three couch-type thickeners.

The three couch-type thickeners, equipped with 48- by 120-in. molds and variable speed drives, increase the consistency of the cleansed filler stock from 1 per cent to the jordaning consistency of 4-4.5 per cent.

The thickened stock is collected in the decker chest, while all water from the thickeners is collected in the decker white water tank.

From the decker chest, filler stock is pumped through a consistency regulator to the jordan filler loop system which supplies 3-4 No. 2-A jordans, according to requirements.

Another consistency regulator then dilutes the stock to 3½-per cent consistency, following which it is pumped to the machine blending chest and then to the machine loop system.

Cylinder machine

The machine is a 121-in. eight-cylinder paperboard unit designed to produce 150 tons per day of high-quality grade board at speeds up to 600 fpm. The cylinders are 48 in. in diameter and driven by sectional electric drives. The maximum finished trim of the paperboard is 105.5 in. in a caliper range of 0.018-0.022 in.

Both filler and liner stocks are bled off the pressurized loop system through eight stuff boxes (one for each cylinder vat).

Leaving the eight stuff boxes, the stock is first pumped in parallel through eight 12-in. diameter cleaners and then by circulating pumps to eight No. 24P selectifier screens. In

addition to the eight 12-in. cleaners, there are six 6-in. diameter secondary cleaners which classify the rejects from the primary cleaners on the liner vat system. The eight selectifier screens assist in better formation through their ability to deflocculate fiber bundles and remove any foreign material that still remains in the stock.

From the selctifier screens the liner and filler stocks are pumped to their respective vats. The vat section consists of five (Nos. 1-5) counter-flow and three (Nos. 6-8) Uni-flo vats equipped with air exhausters.

Cylinder No. 8 is used exclusively on liner stock and cylinders No. 1-4 are operated solely on filler stock. Cylinders Nos. 5-7 can be used on either filler or liner stocks according to requirements.

The couch rolls are equipped with air lift cylinders for pneumatic loading and lifting.

In the felt system of the wet end there is a suction return drum press, a 242-ft. top felt, and a 122-ft. bottom felt. The felts are kept in first class operating condition with (1) a felt washer and spreader of the fixed bow free wheeling expander roll type, (2) felt conditioners at the second press and (3) shower pipes at the whipper and cylinder locations.

This latest type flotation saveall was designed to effect maximum fiber recovery from the white water and to furnish clarified water for reuse on the machine showers.

Operating principle of the saveall is the dissolving of air under pressure in the white water, with subsequent hydraulically-controlled release of the air to furnish microscopic air bubbles to float the fibers. This unit is equipped with the latest patented double-disc inlet valve, designed to create a "vacuum zone" at the instant of air release, producing more and finer air bubbles for the flotation clarification effect.

Nominal capacity of the unit is 1200 gpm. The flotation vat itself is constructed of tile, and metal parts in contact with the water are of stainless steel.

The press section consists of four primary and two main presses. The first, second and fourth primary presses are plain. The third primary has a 24-in. rubber-covered suction roll and a plain top roll. All primary press rolls, with the exception of the third primary, are of the crownless type. The main press section consists of two main presses — the first being a straight-through plain press with crownless rolls and the second a suction straight-through press. The first main press is equipped with a broke conveyor.

The dryer section, located — in a split level arrangement — one floor elevation lower than the wet end of the machine, comprises 98 dryers. These dryers, which are 48-in. in diameter, are mounted on framework of special high-type design to provide good air circulation and eliminate the need for a pit under the dryer section. The dryer section is further equipped with a vapor absorption system.

The automatic temperature control and condensate removal system of the dryer section is noteworthy for its simplicity and reliability of operation. For the purposes of this system, the dryer section is arranged in three sub-sections with a pressure cascading arrangement to assure continuous removal and extraction of non-condensables by means of blow-through.

The condensate from all dryers is returned to a central collection unit. The heat of condensation is recovered in a condenser which furnishes hot water to the mill.

The first group of dryers adjacent to the wet end is equipped with doctor blades and adjustable ball sight-flow fittings. The latter facilitate pressure control and provide visual check of condensate removal.

The finishing end includes two calender stacks, one seven-roll and one five-roll, with loading and lifting done by a combination of electric and pneumatic equipment. An Autoflyte 36 automatic reel and a No. 30 Mill-type winder, capable of handling rolls up to 72-in. diameter, complete the finishing equipment.

Paper machine drive

Each cylinder on the wet end is driven individually by a sectional electric drive. The presses, dryers, calenders and reel are driven through a spiral bevel gear and short center V-belt drive units connected to a lineshaft.

The lineshaft is driven by an amplidyne speed-regulated single motor drive. Power for the 400-hp dc motor is supplied by a dc generator. To maintain close speed accuracy, a voltage signal from a tachometer generator driven by the lineshaft is fed into the amplidyne regulator. The tachometer generator output voltage provides an accurate measure of lineshaft speed.

The amplidyne voltage-regulated wet end helper drive is used to supply added power to the wet end of the paper machine. Eleven gearmotors are used to individually drive the first main press top roll, the primary presses, cylinder molds and suction return drum. Like the single motor drive, an m-g set is used to supply power to these motors. One chief advantage of this voltage-regulated system is that any individual motor load can be adjusted independently without appreciably adjusting loading on other motors.

Instrumentation

A centralized control station comprising two panels — one horizontally and one vertically mounted — controls the majority of the stock preparation system and all parts of the wet end and press sections. It is located adjacent to the wet end of the machine.

Alum and size feed is also controlled from the vertically-mounted panel through Flowraters.

Steam supply

Three automatically-controlled Type A shop-assembled water tube boilers supply a total of 90,000-99,000 lb. steam. The boilers burn natural gas and are designed for 160 psi pressure and normal operation at 125 psi pressure. Each boiler contains 3200 sq. ft heating surface.

Low-odor Latex

(Continued from page 937)

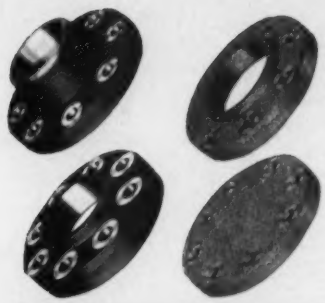
Clay	94 parts
Titanium dioxide (Ra-56)	6 parts
Latex 512-L	15.5 parts
T. S.	61.5 %
Application	3.50-3.75 lbs. per 1000 sq. ft.

The gloss readings were made on a 60° Photovolt gloss meter. Brightness and opacity tests were measured on a G. E. Recording Spectrophotometer employing the wave lengths 457μ for brightness and 560μ for opacity. K & N ink holdout tests were made by applying K & N ink to the surface of the board and allowing to stand for 2 min. before removing the ink and wiping the samples clean. The reflectance of the inked samples was then measured at a wave length of 580μ on a G.E. Recording Spectrophotometer.

As can be seen from the tables, the use of Latex 512-L resulted in a coating with superior gloss and ink holdout, while there were no differences in the opacity test results.

Additional tests showed that: (1) both coatings showed equally good pick and web rub resistance; (2) ink receptivity was better in the Latex 512-L coating, and (3) there was no significant difference in the results of gluing tests.

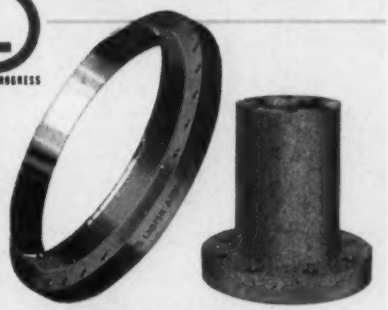
BUTT WELDING FITTINGS
(IPS)



ASA and MSS FLANGES

TO MARK PROGRESS

BUTT WELDING FITTINGS
(TUBE O.D.)



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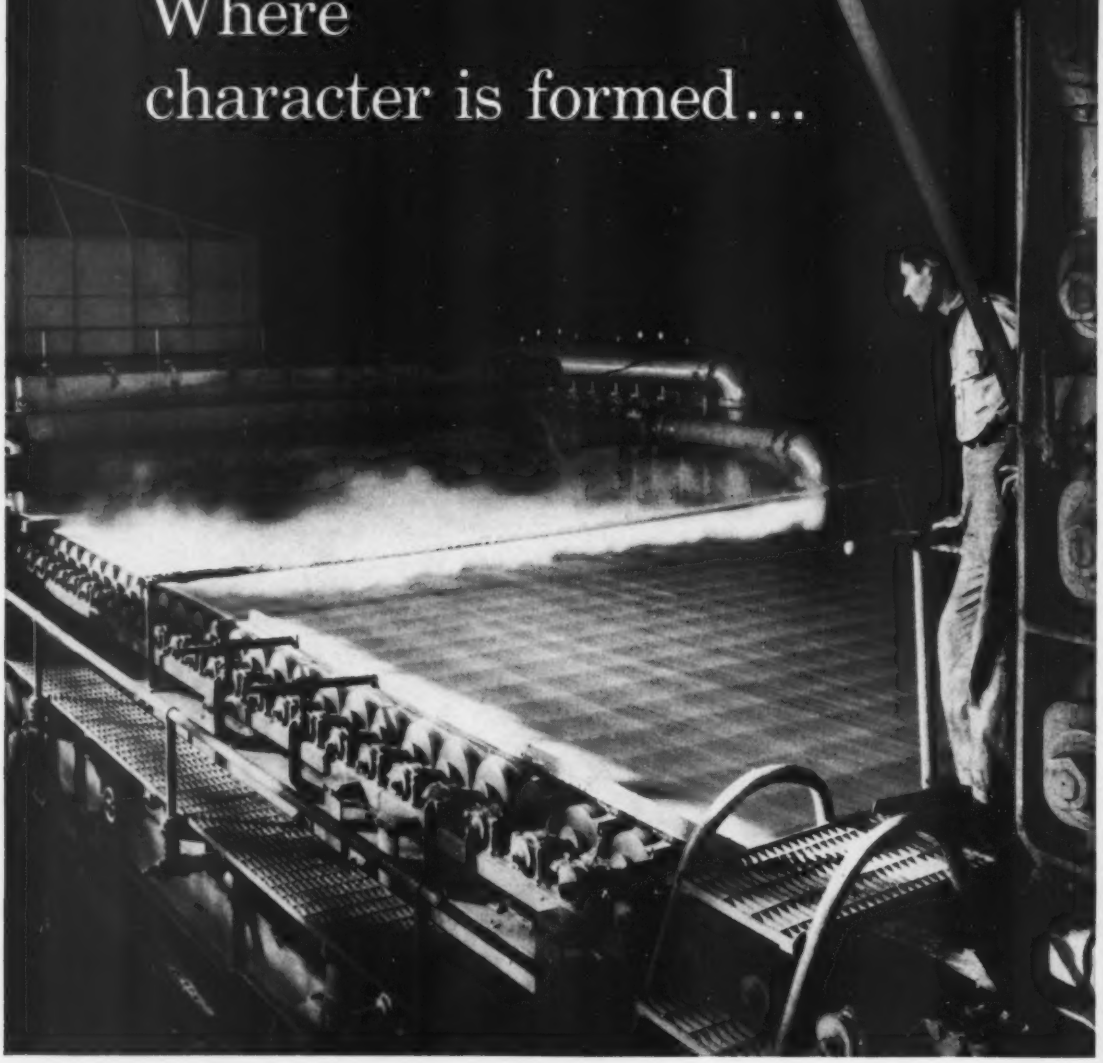

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Extraneous components of American pulpwoods

Part I — The importance of extraneous components

IRVING H. ISENBERG, MARION A. BUCHANAN and LOUIS E. WISE

The Institute of Paper Chemistry
Appleton, Wisconsin

Some of the extraneous components of American pulpwoods are extremely important from the standpoint of the paper and related industries; they characterize the wood, and some are precursors of important industrial products.

TEN YEARS AGO a literature survey was made on the extraneous components of American pulpwoods by the present authors (*46*). This work has been brought up to date, and includes the results of a careful search of *Chemical Abstracts* and *Biological Abstracts* through 1956, with reference to the original article whenever it was available.

At this point it may be well to review the term "extraneous components." A differentiation is made by most wood chemists between the "cell wall components" and the "extractives." The cell walls of all woody tissues contain substantial amounts of cellulose, the hemicelluloses and lignin. Small amounts of other components (like pectic materials and mineral matter) may also be present, but the three first mentioned are the main types. As they occur in the wood they are practically insoluble in cold water and in neutral organic solvents.

On the other hand, there are components in all woods that can be extracted by cold water and/or one or more of such neutral solvents as ether, alcohols, benzene, petroleum ether, chloroform or methylene chloride. These soluble compounds are the "extractives." Often the term "hot water extractives" or "hot water solubility" is found in the literature, and even in the sections which follow in the present article. However, there is now adequate experimental evidence that when wood is treated with boiling water, more than a simple extraction results (*31*). Water, at 100°C, frees acids from the wood which cause the hydrolysis of certain cell wall components. Whereas this treatment does extract substances, it degrades some of the more sensitive hemicelluloses of the cell wall and hence, as an analytical tool, should be discouraged.

Besides the cell wall components and the extractives, there are various substances in many woods that cannot be removed easily by such solvents, but which are nevertheless quite distinct from the cell wall. For example, some woods contain starch grains, insoluble in cold water and in organic solvents, which can be stained with iodine solutions and seen under the microscope. Certain woods contain highly insoluble but discrete calcium oxalate crystals. At times, particles of silica are distributed in the wood. These are not extractives, but they are certainly not a part of the cell wall. According to our definition, both the extractives and these distinctive non-cell wall components are grouped together under the term "extraneous components". There are various borderline cases, such as certain mineral constituents, in which it is difficult to know whether a component should be included within the cell wall or classed as extraneous to this wall. But, in the main the above definition is adequate. In the present paper we have added certain secretions of the living tree, like the oleoresins of the pines. These are not extraneous wood components, but their significance, academically and industrially, is often so great, and they are frequently so closely related to the extractives, that we have included them.

Part II, which will appear in the March issue, discusses and identifies wherever possible the extraneous components present in American pulpwoods. Also to be included is a complete bibliography.

Some of the extraneous components of the pulpwoods of America are extremely important from the standpoint of the paper industry and related areas, and at times this is out of all proportion to the quantities actually present in the wood or the pulp.

Nearly the entire field of organic chemistry may be represented by extraneous components of wood, not all in one species. If we should explore the chemistry of wood in its entirety we might find hundreds, perhaps thousands of these organic compounds.

Extraneous components characterize a specific wood

The extraneous components characterize a specific wood, often far more sharply than do the cell wall components. The former, rather than the latter, lend individuality to the wood. The color of a wood, its odor, and its taste are due to the extraneous components. Some extraneous components increase (and certain of them decrease) the resistance of the wood to insect or fungal attack. Certain of them inhibit the depredations of marine borers. Some also prevent the wood from being suitably pulped by the sulfite process. Others give rise to digester corrosion in the kraft process. Some extraneous components are quite toxic to man, and give rise to annoying industrial hazards. Such properties as ultraviolet fluorescence, or even density, often depend on extraneous components. Certain of them are quite flammable and increase the risk of fire; these same components may also serve to increase the fuel value of the wood. In other words, we can say that the extraneous components "fingerprint" a wood and give it a certain chemical specificity. Although there are often marked differences among closely related species, there are often striking similarities among members of certain plant groups.

Within the past decade, studies on extraneous materials have become intensified. Often in the past, chemists

contented themselves with determining the amounts of materials that were soluble in water, alcohol-benzene, ether, etc. Their interests were primarily analytical. And even today certain color reactions, to be described later, are proving very useful analytical tools. Recently, due to the participation of organic and physical chemists, and to the development of newer laboratory techniques, the constitutions of various wood extractives have been investigated. Further developments in this important area may be expected.

Non-uniform distribution of extraneous components

Whereas the extractives are often found in the cell cavities, they may also be found in the very fine capillaries of the cell wall. Under such conditions extraction becomes very difficult — and sometimes complete extraction is virtually impossible. There are a number of examples in which wood samples were extracted thoroughly with a variety of solvents followed by complete solution of the cell wall modified by rather drastic means only to discover that certain residues remained which were the modified fragments of extraneous components that had not been extracted initially. The distribution of extraneous components throughout the bole of a tree is far from uniform. Often the extractive content of sapwood is very different from that of the contiguous heartwood. The wood rays are usually much higher in extraneous matter than are the fibrous cells.

This difference in distribution of extractives may have a variety of industrial consequences. For example, unbleached spruce or balsam fir sulfite pulp, after passing over a pulp drying machine, becomes sized or nonwettable. This self-sizing is due apparently to the spread or migration of certain of the ether-soluble extractives present in the ray cells through the entire pulp. It is these ray cells of the pulp that are especially high in this pitchy material, even though their content in the wood is low. Such cells retain up to 12-15 per cent of water-impervious extractives. The problem of maintaining the absorptivity of the pulp may be solved, in part, by the mechanical removal of these ray cells from the sulfite pulps.

Often other pitch troubles result from the extractives of coniferous woods. The pitchy ray cells in pulps may cause deposits on the screens, wires and suction boxes of the paper machine, forming sticky masses which occlude dirt and pulp fibers. Seasoning of the wood and chips prior to pulping causes chemical changes which help to mitigate these difficulties, as does the addition of certain chemicals to the pulp stock.

Color reactions show differences in extraneous materials

At times, woods which are related botanically, or have very similar commercial uses, show differences in extraneous materials that can be distinquished by means of simple color reactions. This may also be the case when woods are indistinguishable morphologically. A few examples are in order:

In 1944 a color reaction with methanol-hydrochloric acid was developed by Isenberg and Buchanan. This reagent was applied to wood shavings of a very large number of authentic samples, and any color changes were noted. Complete data were never published, and their paper was only a curtailed report (*45*). Many of the woods tested developed a brilliant violet coloration, others a modified purple; some turned gray, brown or yellow, and a number of samples showed no noticeable change. The violet color was ascribed by Adler (*35*) to the presence of certain tannins of the catechol type, which reacted with coniferaldehyde (or similar groups in lignin). This hypothesis was also advanced by Pew (*35*). If this explanation is correct, there is an interaction, either between two wood extractives or between an extractive and a cell-wall component. In the writers' opinion, this explanation may be an oversimplification.

This same color reaction has served to differentiate between a number of woods. A practical application of the test was reported by Stearns and Hartley (*86*) in differentiating between railway crossties made from black gum (*Nyssa sylvatica*) and those from red gum (*Liquidambar styraciflua.)*

Another color reaction that has proved useful in differentiating between certain woods, and especially between the sapwood and heartwood of pines, depends on the formation of red bis-azo dyes (*21*). Whenever certain phenolic bodies are present among the extractives, these couple readily with a bis-diazotized benzidine reagent giving rise to red coloring matters. Such phenolic extractives as pinosylvin and/or its monomethyl ether occur in pine heartwoods. They are virtually absent from the sapwood. Thus, by bringing a clean pinewood surface in contact with the reagent, the heartwood, which stains a deep red, can be distinguished readily from sapwood, which usually gives a nondescript brown or yellow coloration.

This same benzidine reagent serves in differentiating most of the commercially important white oaks from the red oaks. The white oaks give a walnut or dark-greenish brown color; the red oaks give a pale or medium reddish-orange (*21*).

Some extraneous components are precursors of important industrial products

Some extraneous materials can be considered the precursors of various time-honored industrial products, as well as potential materials. The same components that can be extracted with ether from the southern yellow pines give rise in the kraft cook to tall oil (*91*). In part, they also form the basis of wood rosin. The essential oils in these pines yield sulfate turpentine, and those in sprucewood are the forerunners of the cymene formed in the sulfite cook. Pine stumpwood (heartwood) also gives rise to rosin and to certain essential oils, forming the basis of an interesting industry.

A few woods still serve as the source of dyestuffs, and certain trees yield very important tannins.

Other extraneous materials like the tropolones in western red cedar have been explored after isolation on a pilot plant scale, but up to the present their market value is not apparent. The lignan "conidendrin", present in various coniferous woods and in spent sulfite liquor, when demethylated, has been suggested as an antioxidant for use in fats and oils. Years ago, the water-soluble arabogalactan of western larchwood was envisioned as a raw material for the production of mucic acid — but the exploitation of the latter never gained momentum. Whether or not phenolic bodies like pinosylvin, which are known to be powerful fungicides and insecticides, will ever find a market is a moot question. Of unknown market value at present is the extractive, pinitol, occurring in relatively large amounts in the heartwood of sugar pine (*Pinus lambertiana*).

The following general articles may be of interest: "Recovery and utilization of tree extractives," *Econ. Botany* 9, no.2: 108-40 (1955), by Arthur B. Anderson; "The chemistry of wood extractives," *Chemistry & Industry* 1953: 1325-8, by F. E. King; "Progress in organic chemistry," 1952, by Holger Erdtman (edited by J. W. Cook); "Terpenes (in relation to the biology of the genus *Pinus*)", Ann.Rev.Biochem. 17: 521-40 (1948), by N.T. Mirov; "Wood chemistry," 2nd ed., 1952, Vol. I, pp. 543-688, edited by L. E. Wise and E. C. Jahn.

Glycerine in glassine, greaseproof and parchment

A. W. J. DYCK

Glycerine's special importance is as a plasticizer of those grades of glassine, greaseproof and parchment where objectionable odor and taste are a primary consideration in food packaging; it is estimated that some 3,000,000 lb. of glycerine are used for this purpose.

GLYCERINE is undoubtedly one of the best all-purpose plasticizers in the pulp and paper industry, and as such it was used almost exclusively at one time in sizings, adhesives, varnishes and coatings formulations.

The primary function of glycerine in paper is that of a plasticizer. As such, it prevents brittleness and imparts softness and flexibility, as a result of both glycerine's effectiveness as a plasticizer itself and its hygroscopicity. The beneficial effects of this property are in evidence over a wide range of atmospheric humidity conditions.

In addition, because of its low-vapor pressure, glycerine when added to the paper does not evaporate appreciably while the sheet is passed through the drying sections of the paper machine. For the same reason, glycerine is retained in the paper or coating more or less permanently.

Another extremely important advantage glycerine has is the fact that it is the most acceptable plasticizer from the standpoint of complete absence of odor and objectionable taste.

Despite these advantages, the last decade has brought a variety of other plasticizers which, while in many cases not as acceptable as glycerine, are now widely used in the pulp and paper industry because of their low cost compared to that of glycerine.

Among the newly adopted plasticizers are invert sugars such as Nulomaline; sorbitol; urea; various glycols and their derivatives, such as diethylene glycol. Urea, often used in conjunction with sodium nitrate, is currently enjoying special popularity in the paper industry in the manufacture of grades where the use of higher-cost plasticizers is not essential.

Availability of glycerine

United States capacity for glycerine production seems more than adequate, even in the event of war. Total annual capacity by the middle of 1957, according to *Chemical and Engineering News*, should be about 325,000,000 pounds. Of this total, 185,000,000 pounds should be available from the synthetic processes installed by Dow Chemical Co. and Shell Oil Co., while the remaining 140,000,000 pounds are produced as by-product glycerine in the manufacture of soap.

A more conservative estimate for the 1957 output, in the event that the planned synthetic capacity will not reach the production stage, is 275,000,000 lb. Of this quantity, 150,000,000 lb. are expected to be available as natural glycerine and 125,000,000 lb. from synthetic processes.

The actual output from synthetic and by-product plants in the first six months of 1956 was 131,133,000 pounds as compared with 108,003,000 pounds during the first half of 1955.

Current uses of glycerine

Irrespective of the cost disadvantage of glycerine, there are a number of paper products in which glycerine cannot be replaced by any other plasticizer now on the market. These paper products include some grades of glassine, greaseproof and parchment that are used for specialty applications in food packaging where the absence of objectionable taste and odor is a decisive factor.

These specialty applications for glassine and greaseproof include wrappers for butter, lard, oleomargarine, vegetable shortening and meat; cover papers for milk cans, and sometimes such items as chocolate powder container linings and candy wrappers.

Currently, a total of 7-8 per cent, or roughly 11,000 - 12,000 tons, of the estimated 160,000* tons of glassine and greaseproof papers manufactured in the U. S. are used for such specialty applications. Total glycerine consumption in glassine and greaseproof papers is estimated at over 1,500,000 pounds annually.

The glycerine content in glassine and greaseproof, i. e. in those grades where it is used, ranges from 4-12 per cent on the dry paper basis, depending on the end-use of the product and on customer specifications.

In the production of parchment paper, glycerine is used in about 10-15 per cent of the total estimated annual parchment output of more than 35,000 tons*. With the glycerine content in glycerine-treated parchment varying from 8-30 per cent, total annual glycerine consumption in the manufacture of parchment is estimated at 1,500,000 to 2,000,000 pounds.

*Official figures for the output of glassine, greaseproof and parchment are not available. The figures shown are our own estimates.

Application of glycerine to parchment on the size press. (Courtesy: KVP Co.)

Parchment paper is noted for its high strength and resistance to grease. Accordingly, it is widely used as a wrapper for butter, margarine, lard and vegetable shortening; wrapper for fresh and frozen fish and poultry; wrapper for fresh, smoked, and processed meats; wrapper for tacky foods such as dates, caramels, and other types of candy; gaskets for milk and cream cans, and bakery tray liners.

How glycerine is applied in glassine, greaseproof, and parchment

Glassine and greaseproof are made from highly purified sulfite and semichemical pulps. The fibers are bruised, fibrilated and swollen to an almost gelatinous condition and are then felted into dense and non-porous sheets on conventional paper machines.

After passing through a series of dryers, the semi-dry paper sheet is treated with a 6-8 per cent glycerine solution on the size press (Fig. 1) installed between the dryer sections of the paper machine. Sometimes also small quantities of starch are added to the glycerine solution. The drying of the glycerine-treated sheet is then continued to the desired moisture content in the succeeding drying sections.

Additional glycerine can be added to some grades of glassine, if desired, in the dampener, which is installed at the end of the last drying section.

All glassine grades have to be moisture-conditioned in the dampener prior to being subjected to the heat and high-pressure treatment on the supercalender (Fig. 2). It is on the supercalender where the glassine receives its characteristic high surface finish and transparency that distinguish it from the greaseproof grades.

The use of the correct plasticizer in many of the wide variety of grades of glassine is increasingly important, so that each grade may satisfactorily meet the different requirements of the various uses that have made glassine the indispensable packaging material it is today.

Parchment is made from highly purified softwood and hardwood sulfate pulps. The fibers are first felted into a soft absorbent sheet of paper on a conventional paper machine. This sheet of paper, known as waterleaf, is then parchmentized by passing it through a controlled bath of sulfuric acid, where the cellulose fibers are fused together into a coherent mass. The parchmentized sheet is thoroughly washed in sprays of sterile and filtered water and then passed through a stainless steel pre-dryer prior to going through a size press where it is treated with a 6-8 per cent glycerine solution. The glycerine-treated sheet is then dried in the dryer section of the conventional paper machine.

Other uses of glycerine

An ever widening field of glycerine utilization in the paper industry is in the manufacture of the alkyd resins and ester gums. These glycerine-containing resins and gums are used in coatings (where gloss is a primary consideration) and in various other specialty applications. Water-dispersible alkyds are also used in beater sizes since they are readily precipitated by acids. The alkyd resin and ester gum manufacturing industry has been using on the average about 30 per cent of the total U. S. annual glycerine production.

The cellophane industry is another allied industry that consistently remains a large consumer of glycerine. This industry has been using 11.2 per cent of the total U. S. annual glycerine output. The glycerine contents in the dried cellophane film range from 10-15 per cent.

Among the possible new applications suggested for glycerine is its use in the pulp shredding operation for cellulose nitrate production. It is believed that the addition of small quantities of glycerine to the pulp might facilitate the difficult shredding operation.

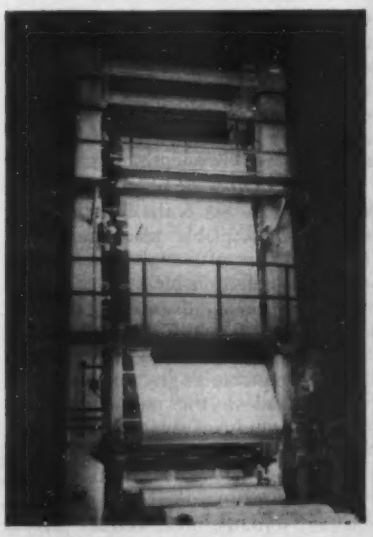
Another study that is being investigated is the effect of glycerine on market semichemical pulp. When pulp, especially semichemical pulp, is dried it loses much of its original strength. The presence of glycerine in the pulp should prevent it from completely drying out and thereby conserve most of the original pulp properties.

Summary

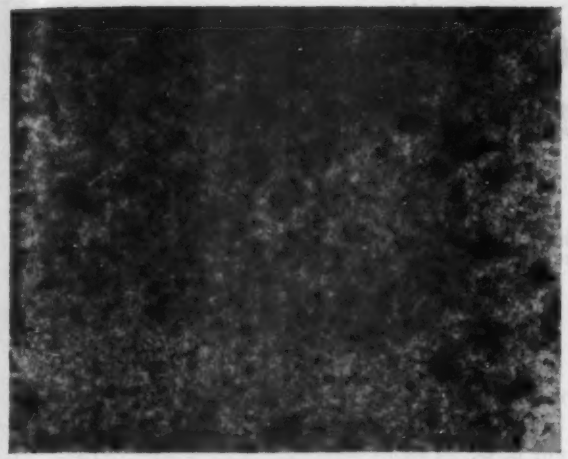
The use of glycerine as a plasticizer is considered essential in those grades of glassine, greaseproof and parchment which are used for packaging food products highly susceptible to the presence of objectionable odor and taste. It is estimated that over 3,000,000 pounds of glycerine are used for this purpose.

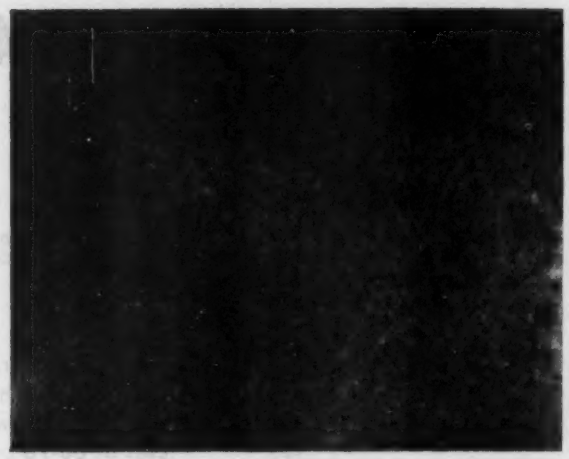
Other uses of glycerine, in which the paper industry is concerned, is in cellophane and alkyd resin manufacture, where in the past years 11.2 and 30 per cent respectively of the total U. S. annual glycerine output were consumed.

Possible new applications of glycerine in pulp shredding operations and addition to market semichemical pulp are indicated.



Here glassine is processed in an Appleton Machine Co. supercalender.





These are photographs of kraft paper from Gibraltar Corrugated Paper Co. On the left is a sample taken before the Sutherland breaker trap was installed. On the right is a sample taken after the breaker trap was installed.

Breaker trap results in increased production and cleaner board

— at Gibraltar Corrugated Paper Co.

JOHN VERWAYEN
Chief Engineer

▶ The installation of the breaker trap between the Vortraps and the centrifugal screens almost completely defiberizes waste paper stock and increases screen efficiency.

SIX MONTHS AGO Gibraltar Corrugated Paper Co. was suffering from a complaint common to many mills processing waste paper. The problem that confronted the mill was that of large quantities of screen rejects. While the good stock in the rejects was reprocessed, the reprocessing consumed extra power and reduced production. To solve the problem, a continuous defibering system in the form of a Sutherland breaker trap was installed between the Vortrap and the centrifugal screens. This resulted in a cleaner sheet, higher production and no increase in power load.

The company is making .009 corrugating medium from old corrugated boxes. The process consists in delivering bales to a 20-ft. continuous Hydrapulper and putting the slushed stock through three 10-in. Vortraps. Leaving the Vortraps with the stock are such waste particles as cellophane, gum wrappers, wood slivers, rubber bands, string, etc. These were rejected by the screens in the standard manner.

In addition, the stock carried with it bunches of fibers that had not been adequately broken up. We estimated that about 5 per cent of the good stock was rejected by the screens for lack of adequate defibering. This cut down the efficiency and capacity of the screens and involved several pieces of equipment needed to separate the good stock from the waste.

The installed Sutherland breaker trap greatly reduces the rejects problem. Stock is now almost 100 per cent defiberized, while leaving the waste particles intact so that they continue to be rejected by the screens. Power consumption is no greater than before, because the breaker trap does as much refining per horsepower as do refiners and jordans.

The improved stock resulting from the installation of the breaker trap increased the efficiency of the two existing screens to such an extent that they no longer have to operate in excess of capacity as they did when rejects were high.

Even more important than the increased production is the improved quality of the board. We now have both a cleaner sheet and much greater crush strength.

Finally, the breaker trap protects the equipment that follows it in the process line. For example, the disc life on the refiners has been increased from 3-4 weeks to 3-5 months. The disc life may average out even higher after operating the breaker trap long enough for our time tests to be completed.

With the installation of the new hydraulic control units on the Sutherland refiners, which greatly facilitates the manipulation of controls during operation, the combined Sutherland defibering and refining systems now provide a satisfactory solution to our processing problems.

The Sprout-Waldron-Anderson FiberPress and extractor in the semichemical pulp mill

DR. J. W. DUNNING* and
C. W. CONVERSE**

▶ The FiberPress is a relatively simple continuous mechanical screw press that has the ability to (1) fiberize semichemically-cooked chips and (2) dewater cooked chips or pulp to consistencies of 60-70 per cent B. D.

THE SIMPLEST FORM of a continuous mechanical screw press is a screw conveyor equipped with a perforate housing, as shown in Fig. 1. Even though this unit normally is considered to be a drainage vessel, it could be argued that the slight impact force of the worms of the conveyor against the solids being conveyed compacts these solids intermittently and to a very slight degree. It therefore dewaters them slightly more than if they remained static on a perforate screen.

As you are aware, a screw conveyor imparts a vector of force on the material being conveyed in a direction parallel to the shaft of the conveyor. Another vector of force, however, is imparted on the material at 90° to the axis of the shaft. As the pitch of the conveyor decreases, the conveying capacity at any one rpm is decreased, while the conveying force increases. In addition to the above forces, there is also a case friction or a frictional drag between the material being conveyed and the housing of the conveyor.

If a screw conveyor is operated full, at least one of three results may occur:

(1) The worms of the conveyor may merely turn in the mass of material and not advance the material in a forward direction;

(2) The mass of material in the conveyor may turn with the worms and thereby not be advanced forward, or,

(3) The conveyor may advance the material forward, but because of the case friction between the housing and the material, excessive pressures may be built up which result in a folding back of the worm flights.

First continuous screw press

In the late 1800s Anderson developed the first continuous mechanical screw press, which was used initially in the vegetable oil field. During this development he found that a continuous helix, as illustrated in Fig. 1, more often than not would either turn on the material in the press or would cause the material to rotate with the worm, and no work, thereby, would be accomplished. He found, however, Fig. 2, that if breaker bolts were inserted at the end of each helix, and that if actually discontinuous and separate worms were employed the material being processed would be caused to move parallel to the shaft of the conveyor. After repeated tests, it was found that the pressures being attained in this unit necessitated much heavier shafts, worms and housings than previously used. It was a relatively simple matter to fabricate heavier shafts and worms. In order to increase the strength of the housing, however, a heavy barrel housing, lined with barrel bars, was devised. These things accomplished, it was then discovered that some form of automatic feed device was required: first, to provide a more or less constant volumetric rate of feed to the pressing worms; and, secondly, to provide a means of compensating for the relatively high decrease in volume of a material as it was initially compressed.

These various tests resulted, in about 1900, in the expeller shown in Fig. 3. This drawing shows the Model No. 1 expeller, which was the first continuous mechanical screw press. It is equipped with discontinuous and separate worms on a center shaft. Breaker bolts were inserted through the housing to more or less fill the gap between the individual worms. In this first model a quill worm automatic feed device was employed. The quill worms or feed worms are welded on a tubular shaft, which is concentric with the main shaft carrying the pressing worms. In addition, this model was also equipped with a cone type choke mechanism, which permitted to a degree, by movement of the cone in or out, a variation of the pressure built up on the material being processed within the machine.

Although this early Model No. 1 expeller was a major contribution to the processing industry, in the early 1900s it had many disadvantages. For example, the quill worm automatic feed device imposed problems of transmission design and concentric shaft lubrication. By utilizing concentric shafts there was a difficulty of providing a sufficiently large diameter inner shaft for the pressing worms and yet maintaining the wall thickness of the outer tubular shaft great enough to withstand the stresses imposed upon it. Over the course of years the pressures utilized within the expeller were increased so that increasing shaft diameters were required for added strength. By increasing the diameter of the shafts, however, the diameter of the pressing worms likewise was increased, thus increasing the torque on the shafts. This, in turn, would require even larger shafts. This direction of large diameters, therefore, did not appear to be the solution to the problem.

In addition, the cone choke did not permit a sensitive adjustment of the pressure on the processed ma-

*Vice president, V. D. Anderson Co. (division of International Basic Economy Corp.), Cleveland.
**Manager, Pulp & Paper Mill Div., Sprout, Waldron & Co., Inc., Muncy, Pa.

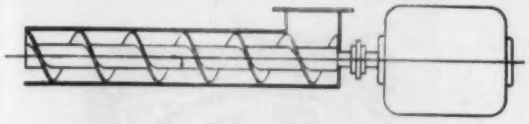


Fig.1 Schematic Drawing of Screw Conveyor

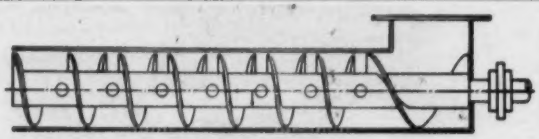


Fig.2 Schematic Drawing of Screw Conveyor with Discontinuous Worms.

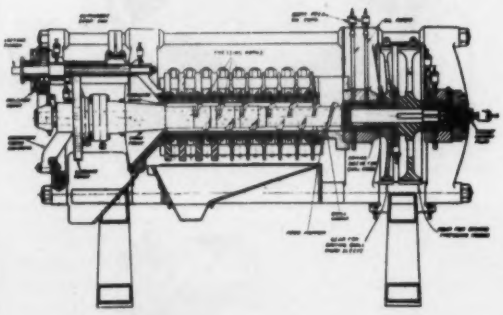


Fig.3 Drawing Expeller, Model No.1.

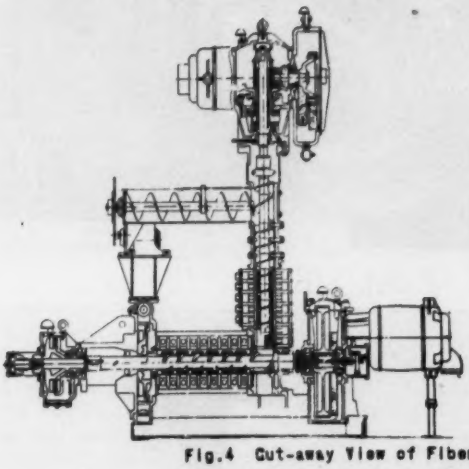


Fig.4 Cut-away View of FiberPress.

terial within the expeller because of the frictional drag of the material across the cone area. A wide variety of shaft arrangements were, therefore, required to make up for the inadequacies of a cone choke mechanism. In addition, overheating of the process material quite often resulted.

Over the years these several disadvantages of the early expeller were studied in an attempt to design a machine that was simpler in construction, would permit processing at higher pressures and would offer a wider variation of operations. As a result of these studies a two-stage press was designed and patented. This led to the manufacture of the FiberPress, which is employed today in several pulp and paper applications. The two primary advantages of this press over the earlier presses are the simplicity of mechanical design and the versatility of operation that this design permits.

The modern FiberPress

The FiberPress, illustrated in Fig. 4, consists of a feeder, a vertical press section with its own transmission and motor, a horizontal press section with its transmission and motor, a new choke jaw mechanism and the main worm thrust bearing. The vertical shaft is equipped with removable separate discontinuous worms with knife bars extending nearly to the shaft at the end of each helix. The horizontal worm is normally a solid shaft with individual discontinuous worms built up on this shaft. The number of worms used on this horizontal shaft and the specific design of the worms affect the pressure built up in the processing of any one material. The more slippery a material or the lower the case friction between the material and the housing, the fewer are the number of worms that are required. However, since wood pulp materials in general offer a considerable case friction within the FiberPress, a mild worm arrangement is employed in this event. The barrel housing is shown in Fig. 5. Here a half section of a horizontal barrel is shown as it is being lined with barrel bars, which are separated by bar clips. The choke mechanism is shown in Fig. 6. The choke jaws, which are stationary with respect to the movement of the shaft, are guided by a grooved outer ring. This outer ring in turn is moved by means of a worm mechanism. By manually turning the worm mechanism, the outer grooved ring is turned to position the choke jaws to build up the desired pressure on the material being pressed. Because of the relatively low case friction of the material across this choke mechanism, sensitive pressure adjustments within the machine may be realized. This makes it possible to use one design of shaft arrangement for a relatively wide range of materials. It also permits a simple start-up and shut-down of the machine by opening and closing of the choke mechanism as required.

To give an indication of the necessity for rugged construction of the FiberPress, it might be worth mentioning that this machine, when equipped with a 50-hp motor on the horizontal shaft, operating at 45 rpm, develops a maximum torque of 7300 ft. lb. The maximum thrust may be as high as 48 tons.

Fiberizing and dewatering action

Let us assume that we are fiberizing and dewatering semichemical chips in the FiberPress. These chips are conveyed by the feeder at a constant volume to the vertical press section. In this vertical section the material is compressed to an increasing degree as it travels down the shaft. Approximately 60-70 per cent of the liquor to be expressed is removed in the vertical section. A plug of the compressed and partially fiberized chips is built up at the bottom of the vertical section. The horizontal worm then conveys this material at 90° to the horizontal unit. In making this 90° turn, there is a forceful rubbing of wood chip over wood chip so that a considerable degree of fiberizing is realized at this transition point. The fiberized chips are conveyed along the horizontal shaft where pressures in FiberPresses up to, perhaps, 8000 psi are attained. When the FiberPress is shut down the choke jaws are opened to relieve the pressure within the machine, and then the feed is stopped. Under these conditions the FiberPress may then be started up again with no difficulties.

Fig.5 Lining of Barrel Housing with Barrel Bars.

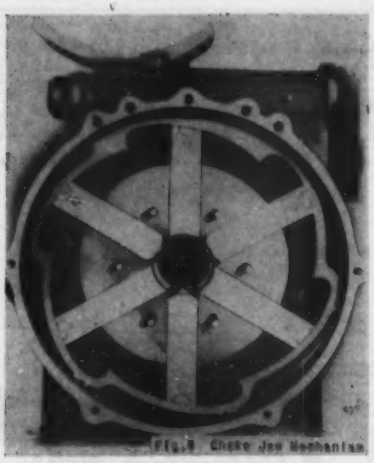


Fig.6 Choke Jaw Mechanism

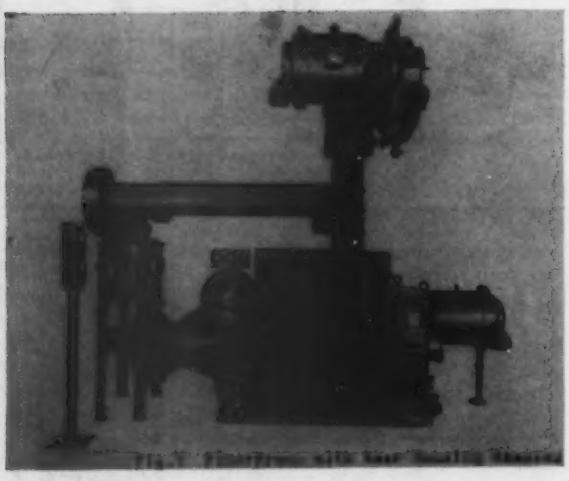


Fig.7 FiberPress with Near Housing Removed

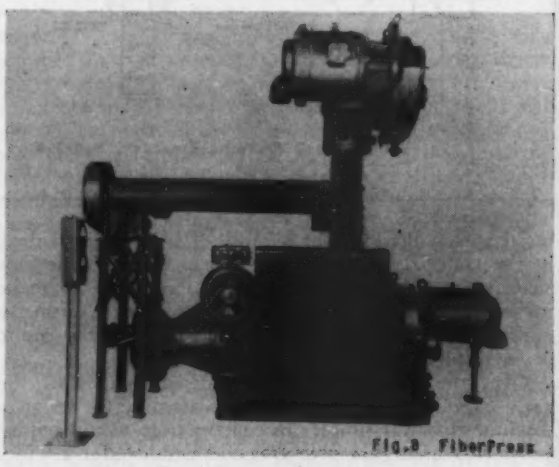


Fig.8 FiberPress

Fig. 7 is a picture of the FiberPress with the near housing removed. Fig. 8 is the same machine with the housing intact.

From an inspection of design of the FiberPress as shown in Fig. 4, it is apparent that the vertical section may be used as a feeder valve that can seal off the horizontal section from the atmosphere. One then could use the horizontal section of the press as a high-pressure, very short time pressure reaction chamber. On the other hand, the barrel bars of both the vertical and horizontal sections may be spaced so that drainage may be obtained along all sections of both barrels. This versatility and simplicity of design thereby permits a relatively wide range of use of this machine.

From the description of the FiberPress it could be assumed that one of the simpler operations that could be performed with this machine would be the dewatering of pulps. In our pilot plant in Ceveland we have made many dewatering tests on washed and washed and bleached semi-chemical and kraft pulps and groundwood pulps. In dewatering these materials there is an extreme decrease in volume from the initial pulp slurry fed to the press to the final dewatered pulp. In fact, these dewatered pulps may have densities ranging from 18 to 27 lb. per cu. ft. Because of this decrease in density, the vertical shaft is operated at a relatively high speed compared to the horizontal shaft.

The many tests made in different pulps have indicated that washed and bleached kraft pulps offer the highest resistance to passage through the FiberPress. On the other hand, groundwood pulps offer the least resistance. As a consequence, the choke mechanism must be closed further when pressing groundwood than when pressing kraft. In any case, these pulps may be pressed to fiber consistencies ranging from 55 to 70 per cent or higher, depending upon the goal of the specific operation.

Efficiency of recovery of soluble solids

Since the FiberPress can dewater pulps to these consistencies, it would be apparent that this machine would offer unusual efficiences in the recovery of soluble solids from digester chips. For example, in the recovery of soluble solids from a kraft pulp, we could assume a pulp containing 11 per cent O. D. fiber and a soluble solids consistency in the black liquor of 26 per cent. It may then be calculated that this sample would contain 89 per cent total liquor and 23.15 per cent soluble solids. If this kraft pulp were pressed to a material containing 40 per cent moisture, 85.1 per cent of the soluble solids would be in the recovered black liquor. In order to calculate these recoveries, we employ the equation:

$$\frac{\%H_2O \text{ in pressed pulp}}{1.00 - (\text{S.S. conc. in liquor})\ (0.01)} - \%H_2O \text{ in pressed pulp} = \text{lbs. soluble solids per 100 lbs. pressed pulp}$$

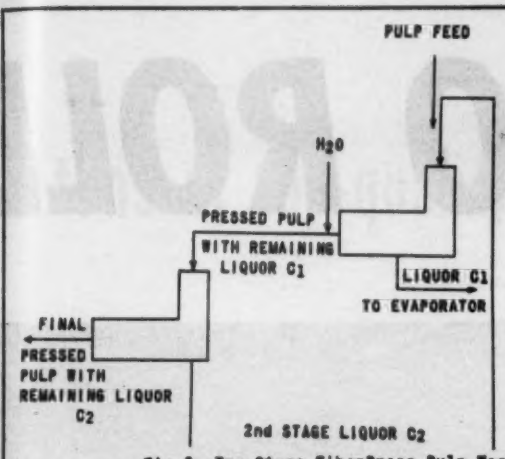


Fig.9 Two Stage FiberPress Pulp Washing Flow Sheet.

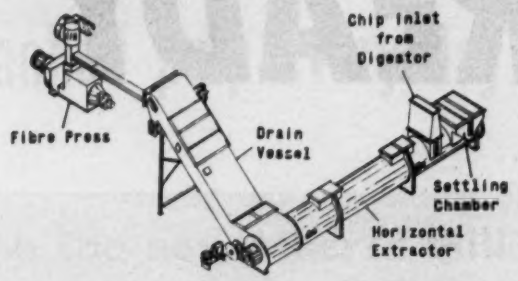


Fig.10 Digested Chip Soluble Solids Extraction System.

Having calculated the soluble solids in 100 lb. of the pressed pulp and knowing the moisture content, it is then simple to calculate or determine the amount of fiber in the 100-lb. sample. The amount of soluble solids with that same amount of fiber in original sample may be calculated so that the recovery percentage may be determined.

If a greater recovery of soluble solids is required over that which can be accomplished by a single pressing, a two-stage or multiple-stage pressing is required. In this instance the flow sheet of Fig. 9 may be used to illustrate the process and mathematics involved.

If one were to assume the same kraft pulp sample as indicated above, and if one were to press the pulp in both stages to a material of 55 per cent O. D. fiber consistency, and, finally, if 2 lb. of water per pound of O. D. fiber were used as wash water, 97.4 percent of the soluble solids could be recovered in a two stage-system. This would furnish a liquor to the evaporators of 24.0 per cent soluble solids concentration. The washed pulp would contain 114 lb. of soluble solids per ton of O. D. fiber.

If 4 lb. of water were to be used per pound of O. D. fiber under the same conditions as above, the 98.8 per cent of the soluble solids could be recovered. In this instance the black liquor to the recovery system would contain 20.1 per cent soluble solids and the washed pulp would contain 55.8 lb. of soluble solids per ton of O. D. fiber. This system is slightly more efficient than a three-stage system wherein the pulp is pressed to approximately a 40 per cent fiber consistency.

In the recovery of black liquor from semichemical chips, we could assume a sample which contained 22.6 per cent O. D. fiber consistency and 16 per cent concentration of soluble solids in the black liquor. It may be then calculated that the sample will contain 77.4 per cent liquor and 12.4 per cent soluble solids. If this material were pressed in a single fiber press to a pulp that contained 40 per cent moisture, 73.5 per cent of the soluble solids would be removed. The liquor to the evaporator, of course, would be approximately 16 per cent soluble solids concentration.

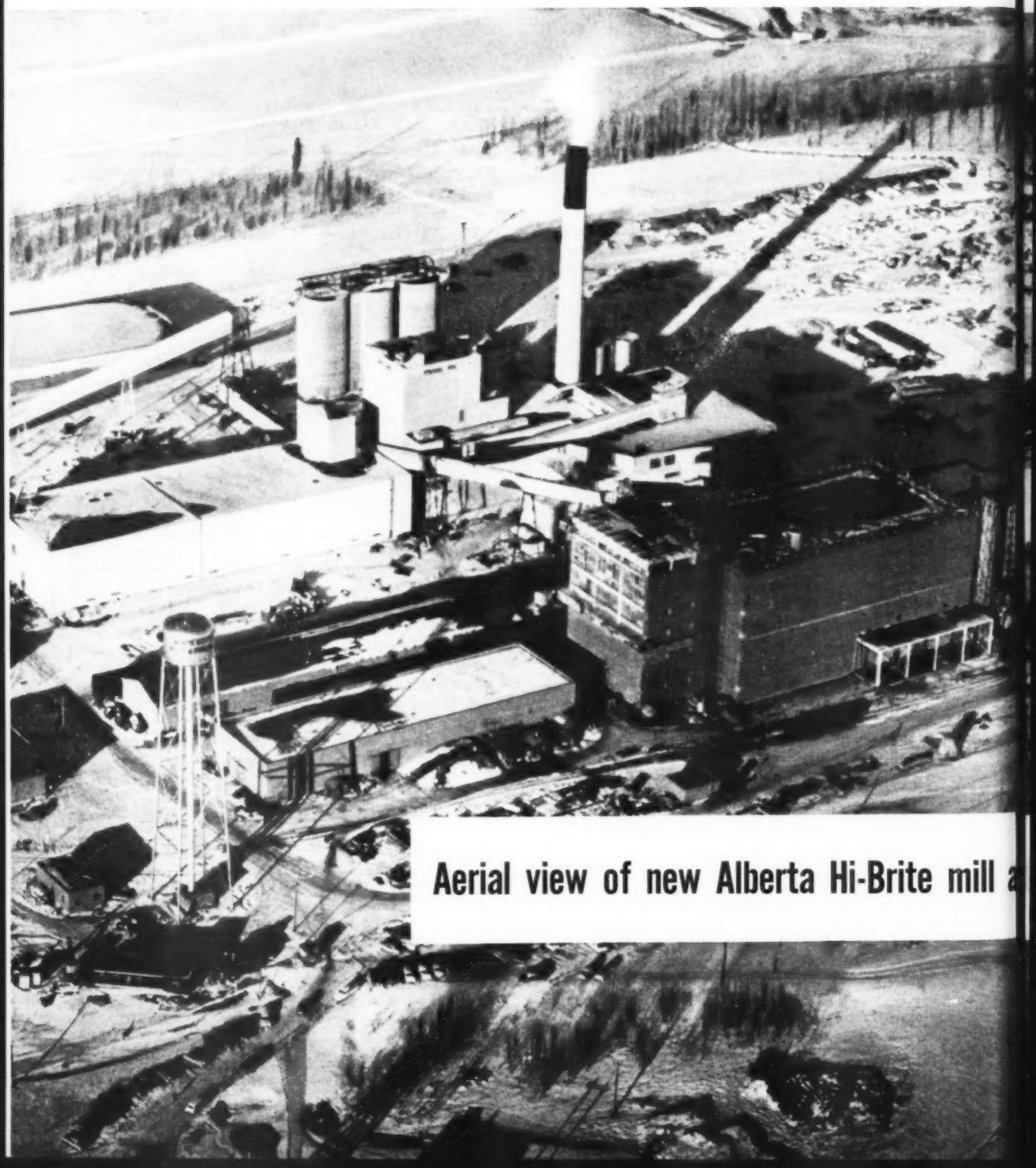
If a two-stage counter current washing system were employed as illustrated in Fig. 9; if 2 lb. of water per pound of O. D. fiber were employed as wash; and if the chips were pressed to a 55 per cent fiber consistency, then 94.0 per cent of the soluble solids would be recovered. Under these conditions the liquor to the evaporator would be 12.1 per cent soluble solids concentration and the pressed pulp would contain 65.4 lb. of soluble solids per ton of O. D. fiber.

This two-stage FiberPress wash system on neutral sulfite semichemically cooked chips requires a diffusion vessel ahead of the No. 1 press in order to obtain 94 per cent chemical recovery. Because of the size of these chips, approximately 30 min. time is required for diffusion of the dilute liquor from No. 2 press into the chips being conveyed to the No. 1 press. Since this system necessitates a 30-min. diffuser and two presses, work was undertaken to convert the diffuser to an actual hot water extractor followed by one press as illustrated in Fig. 10. This system eliminates one fiber press from the operation and, in addition, makes possible the recovery of more soluble solids from the chips at a slightly higher concentration and with somewhat less water than in the two-stage FiberPress system itself. The successful operation of this system requires a uniform chip feed and uniform water addition.

In addition to the dewatering or reclamation of soluble solids from neutral sulfite digested wood chips, the FiberPress also performs a considerable fiberizing of these chips, as illustrated in Fig. 11. This macrophotograph is an enlargement of a sample of neutral sulfite chips fiberized in the FiberPress after disintegrating by means of a 10-sec. beating in a Waring blender. The photograph shows a high degree of fiberization, which makes subsequent refining require considerably less horsepower than if the semichemical chips were refined directly. Although the reduction of horsepower depends upon the nature of the ultimate pulp to be made, this reduction amounts to 25-40 per cent.

Fig. 11—Water dispersion of neutral sulfite chips defiberized in the FiberPress.

READY TO ROLL



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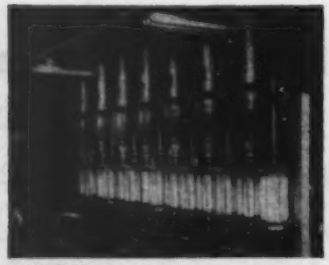

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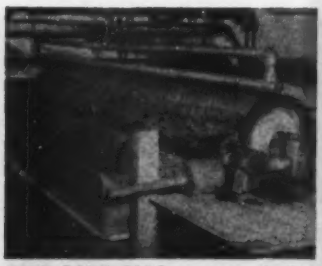

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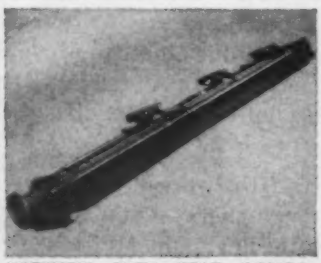

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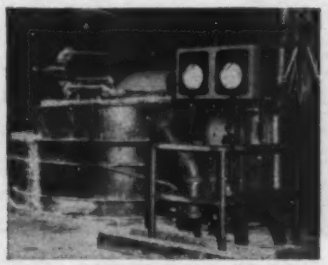

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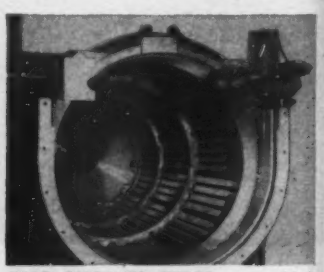

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CURRENT COMMENTS

Tariff reversals . . . newsprint hikes . . . and geographical reappraisal

The session of Congress now in its opening weeks will see a notable reversal of relationships to the tariff problem. Southern Democrats, long regarded as the chief proponents of a free trade doctrine, are likely to become the most active supporters of protectionist policies. The Republican administration, however, will oppose any further efforts to tighten up restrictions on import trade through reciprocal trade agreements or other measures.

This tendency was demonstrated in the first days of the new Congress, when no less than seven bills on foreign trade were introduced. One of particular interest to the paper industry was to place casein on the duty-free list. The coated paper industry has been a large user of casein from Argentina and other dairy countries, and the domestic opposition to lower duties has faded with the finding of other markets by United States dairymen. Measures to tighten up the anti-dumping law will be vigorously opposed by importing interests, while the administration's efforts to secure legislation to place this country in the Organization for Trade Cooperation will be opposed by the protectionist group and, to some extent at least, by the southern Democrats. One reason for this shift in alignment is the fear of the Southern cotton states of loss of the cotton textile market to Japanese competitors.

While all tariff legislation will originate in the House of Representatives, and while more and possibly more stringent proposals will appear as the session advances, the final work will be in the Senate finance committee. The retirement of Senator George as head of that committee has been followed by the accession of Senator Gore, a well-known liberal, to the chairmanship; but on the Republican side a staunch conservative, Senator Jenner of Indiana, will be the minority's senior spokesman.

FTC watches newsprint

A rash of newsprint price increases is anticipated as a result of the Abitibi announcement of a $4 per ton price raise, and strategic moves in government and elsewhere are already underway.

The Federal Trade Commission, spurred by Congressional elements, is watching the situation and even considering joint action with the Canadian Restrictive Trade Practices Commission along the lines of anti-trust action. United States mills have given no indication at this writing of any plans to follow the Abitibi lead. The publishers' associations are protesting violently. On the other side of the picture, Hudson Pulp & Paper Corp., which had been considering erection of a newsprint mill in the South, has decided that the supply-demand situation is such that it is releasing its tentative newspaper publishing customers from their preliminary contract agreements. Inasmuch as Canada provides such a large part of United States consumption, the Federal Trade Commission is practically powerless unless it can enlist the Canadian authorities.

Go east, young man

Western paper mill capital is moving into the eastern and midwestern market in a big way. Weyerhaeuser has acquired nearly 100,000 acres of land in Missisippi and Alabama for "reforestation purposes." The land is marginal in that it is not carrying a present stand of merchantable timber, and the plan is to develop it intensively for eventual utilization for the production of pulp. This, because of the character of the land, is something for the more or less distant future but is indicative of a broadening of western interests into the field now largely in the hands of eastern paper mill capital.

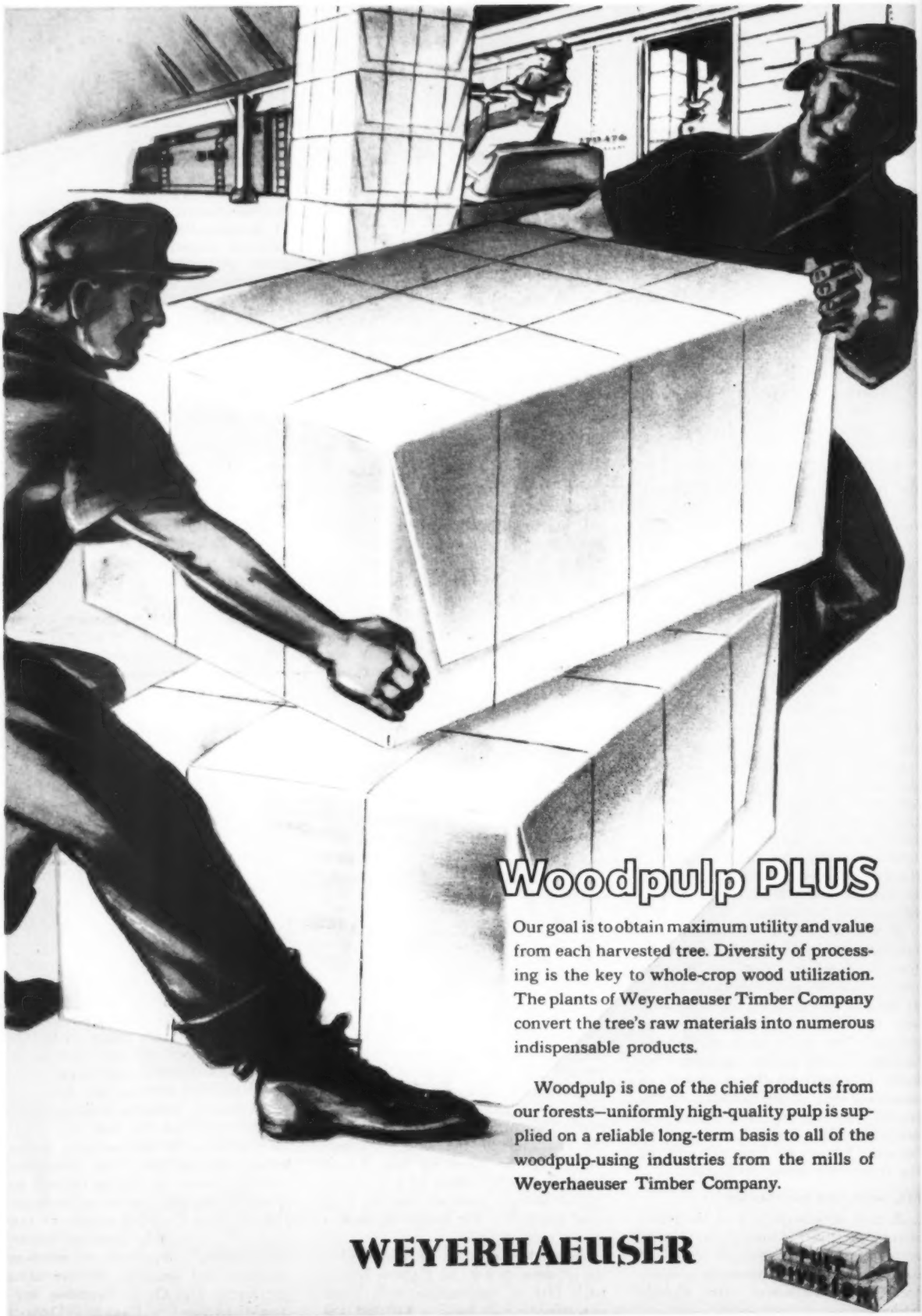
A second indication of this trend is the announcement by Crown Zellerbach that in cooperation with *Time* magazine it will build a $30,000,000 machine-coated printing paper mill at St. Francisville, La. Half of the 70,000-ton annual output will go to *Time*, and the balance will be marketed in the East and Midwest by Crown Zellerbach. This development is another evidence of the reports that the book paper industry is on the way to utilization of southern hardwoods, as has already been so successful with pine in the newsprint field. Crown Zellerbach in connection with this and other expansion plans has secured $60,000,000 by a series of 25-year notes to a group of 11 institutions, such as insurance companies, pension funds and the like.

Time magazine's move into the Crown Zellerbach orbit has an interesting relationship to other previous participations by *Time* in papermaking projects. *Time* is reported to have made a profit of $6,000,000 by the sale of securities of another company in which a different northern papermaking concern was jointly interested.

Meanwhile, International Paper Co.'s invasion of the Pacific Northwest has taken a favorable turn. The United States Court of Appeals for the Second District has dismissed a petition by the Federal Trade Commission for an injunction which would have prevented International from taking further steps to consummate its merger with Long-Bell Lumber Co.

Canadian future

A Chicago group of investment analysts has heard Canadian experts on the industrial future of Canada. Douglas W. Ambridge, president of Abitibi, told the group that the Canadian paper industry, instead of facing damaging competition, will grow substantially in the next ten years through research and improved forestry practices. He said that Canada is now on the way to using almost every type of tree that grows in Canada, instead of relying entirely on spruce as was the case in earlier years. He said that Canada's supply of raw materials is steadily growing larger, both through improved reforestation methods and research. At the same conference Dr. O. J. Firestone, economic adviser to Canada's Depart-



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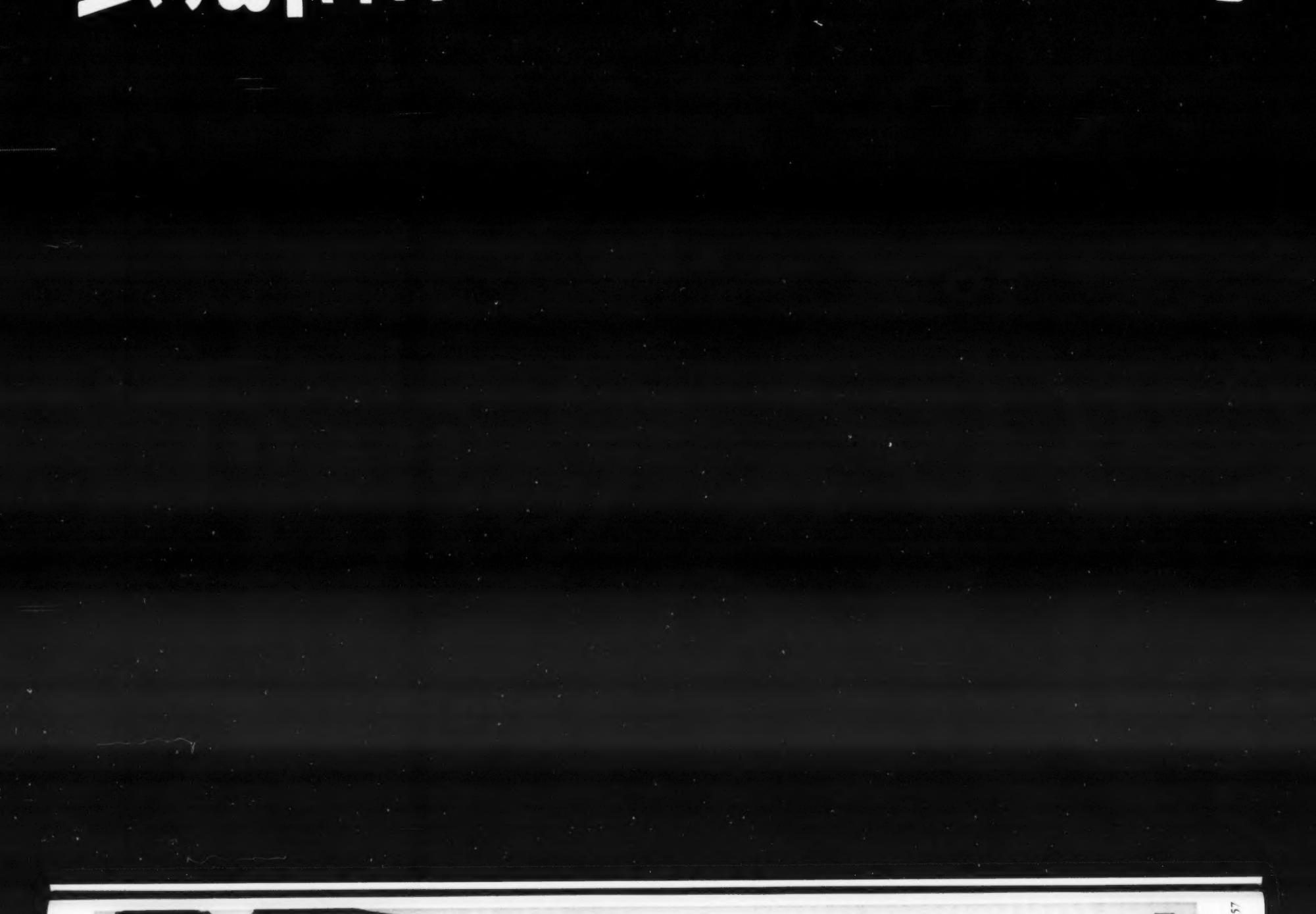


Current Comments . . .

ment of Trade and Commerce, urged American capital to operate their Canadian subsidiaries with the same degree of efficiency that they apply in their home plants. He would like to see Canadian managers of American-owned facilities given a larger degree of responsibility and initiative in their positions. Dr. Firestone said that 1957 capital investment in Canada will be at least 10 per cent higher than in 1956. He visualized another period of expansion at hand commensurate with that experienced in the mid-sixties, especially in hydro development, transportation, communications and institutional investment.

Stock and Bond Quotations

New York Stock Exchange — Stocks

Closing Prices	Dec. 31, 1956		Dec. 31, 1955
A.P.W.	5		4½
Celotex	36½		34⅜
Same Pref.	17¾		19½
Certain-Teed	10⅜	(Old)	24⅜
Champion P& F	34¾	(Old)	60
Same Pref.	94		104½
Chesapeake Corp.	31¼		—
Container Corp.	15⅛	(Old)	74¾
Same Pref.	88		104
Crown Zellerbach	53¼		56½
Same Pref.	92		102⅛
Dixie Cup	49¾		55½
Eastern Corp.	27⅜		29⅛
Federal Paper Board	33¾		34¼
Same Pref.	19¾		—
Fibre Paperboard	31		—
Same Pref.	103		—
Great Northern	82		95¾
Hammermill	38¼		37⅛
International	105		112½
Same Pref.	90½		103
Kimberly-Clark	42¼		45⅛
McAndrews & Forbes	33¼		48½
Marathon	33		33⅞
Masonite	33½		36¾
Mead Corp.	36¼	(Old)	70
Same Pref.	86		102
Minnesota & Ontario	32⅜		66½
Oxford Paper	40⅛		36½
Same Pref.	92		101
Rayonier Inc.	30⅜		40¾
Riegel	31⅞		—
St. Regis	46½		42⅛
Same Pref.	93½		102
Scott Paper	59¾		67⅞
Same $3.40 Pref.	78½		95
Same $4.00 Pref.	93		103
Sutherland	36¾		47
Union Bag-Camp	33⅞	(Old)	97
United B & C	21⅛		24
United Wallpaper	6¼		2⅜
Same Pref.	8		21
U. S. Gypsum	56⅜	(Old)	290½
Same Pref.	156½		179
W. Va. P. & P.	43¾		46
Same Pref.	104		106

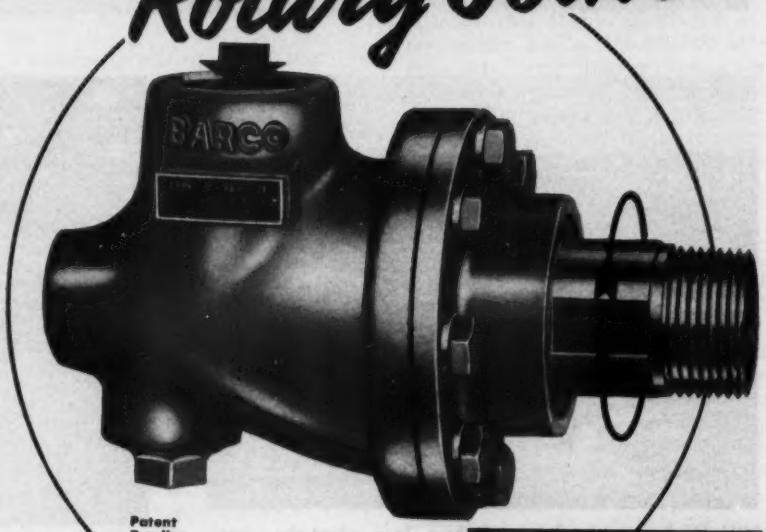
New York Stock Exchange — Bonds

A.P.W. 5%	81		81⅛
Champion P. & F. Co. 3¾%	97¼		—
Champion P. & F. Co. 3%	91⅛		97½
Mead Corp. 3¾	97		97
Scott Paper 3¾	95		95

American Stock Exchange — Stocks

American Writing	22½		19¾
Brown Company	16½		17¾
Puget Sound	17⅛		—

NOW-A Better Rotary Joint!



Patent Pending

SIZES
½" ¾" 1" 1¼"
1½" 2" 2½" 3"

NEW BARCO TYPE C Rotary Joint

Announcing...

It's new! It's simple! It's versatile! And for countless applications, Barco's new Type C Rotary Joint will give you the best operating records you've ever had.

FOR ALL SERVICES—One basic style of revolving joint for single flow or syphon flow ... one basic seal for steam, air, water, oil, gas — *or alternating hot and cold!* For temperatures to 450°F. Special to 500°F.

NO LUBRICATION NEEDED — Bearings and seal self-lubricating. Seal self-adjusting for wear. Long life without repairs or maintenance.

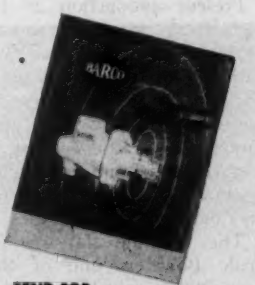
LOW TORQUE — Low starting and running torque*. Saves power. Suitable for any ordinary speed. To 200 psi, steam, or 400 psi, hydraulic.

COMPACT, SIMPLE — Malleable iron body; heat treated steel shaft; R.H. or L.H. thread. Eight sizes, ½" to 3".

**Typical example: 12 in. lbs. starting torque for 1" Type C on 100 psi water. Rotating torque, same.*

for

STEAM
WATER
OIL
AIR or GAS



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NEWS of the INDUSTRY

MILL OF Bowaters Southern at Calhoun, Tenn., where the completion of a $30,000,000 expansion program has brought annual production up to 300,000 tons.

DESIGNED TO produce newsprint at speeds of up to 2500 fpm, this Beloit Iron Works machine recently went "on the line" at the Tennessee mill.

Start-up of Third Machine Gives Bowaters 300,000-ton Capacity

NEWSPRINT production at the Bowaters Southern Paper Corp. plant in Calhoun, Tenn., is expected to double by 1959 to bring annual capacity to about 400,000 tons. The move results from the tremendous demands of publishers in the South and Southwest.

Now supplying more than 150 newspapers, the plant has already sold its entire output through 1959.

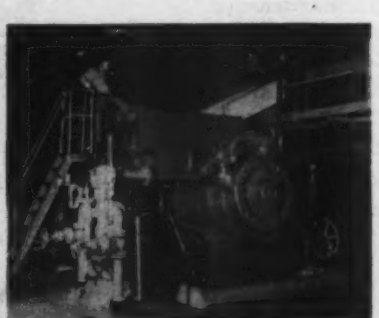
Present production is from two high-speed machines operating at 2150 fpm. A third unit (100,000 tons) was scheduled to go into production in mid-January, while a fourth machine is now under construction and is expected to be in operation early in 1959. The latter machine will be designed for an annual output of 130,000 tons.

The machine start-up in January made Bowaters one of the largest newsprint producters in the United States. The unit, designed by Beloit Iron Works, operates at 2500 fpm and has increased the mill's daily consumption of pine pulpwood from 1200 to 1350 cords.

A three-section Ingersoll-Rand barking drum (12 by 67.5 ft.) and necessary conveyors were installed and integrated into the existing system. A 21-in. Cambio debarker furnishes approximately 50 cords of barked hardwood per day to the pulp pilot plant.

Groundwood

Six Great Northern Waterous grinders (each producing 67 tons of pulp per day) bring the groundwood mill to a total of 14 grinders and increase capacity from 400 to 800 daily tons. Each unit is driven by a Electric Machinery Mfg. Co. 6000-hp synchronous motor.



NEW GRINDERS are turned by 6000-hp electric motors. The mill's daily wood requirements exceed 1200 cords.

Additional screening and refining equipment: two 36-in. single-disc Sprout-Waldron refiners with drainers; three Mark A and one Mark E Cowan screens; 12 Dirtec units, and three 5- by 14-ft. Allis-Chalmers low-head vibrating coarse screens.

Six newly installed 8- by 16-ft. Impco deckers bring the total of groundwood units to 14. Two tile chests for groundwood storage were built by Stebbins and equipped with Shartle agitators.

Metering is accomplished with a Cowan proportioner. Kraft stock to the unit is refined by two Jones jordans. Paper machine broke is thickened in a 11.5- by 20-ft. Impco saveall, then refined in a Jones jordan.

Paper Machine

The fourdrinier is designed for a wire 276 in. by 130 ft. and is equipped with a 38-in. diameter breast roll, 23 table rolls 14-in. in diameter, six flat boxes, a 44-in. suction couch roll and a 38-in. wire turning roll. The fourdrinier, which also has two additional drive rolls, is removable as a unit for wire changing. All exposed framework is protected with stainless steel.

Stainless steel savealls extending from the breast roll to the suction couch roll discharge white water to a tile collector chest. The water is

then pumped to the Bird screens for dilution by a 23,000-gpm Ingersoll-Rand fan pump.

The press section consists of a 32-in. suction pick-up roll, a suction transfer press and two straight-through suction presses. The Beloit suction rolls are of centrifugally-cast brass with air-loaded packing, and each is equipped with a stainless steel saveall. The transfer press has a 42-in. bottom suction roll and a 36-in. rubber-covered top roll. The pick-up felt is equipped with a 32-in. suction wringer roll and a 36-in. rubber-covered roll. The second and third presses have 44-in. rubber-covered bottom suction rolls and 42-in. granite top rolls. Air-loading is arranged to apply and regulate nip pressure between top and bottom rolls.

Fulfilling vacuum requirements are 11 Nash Hytor vacuum pumps, eight of which are driven by a single 1750-hp Electric Machinery synchronous motor.

Dryer Section

The dryer section is divided into three parts and has a total of fifty-five 60-in. paper dryers and eleven 60-in. felt dryers. Dryer drainage is by a Ross Midwest Fulton forced-vapor circulating system. The section is equipped with a Ross totally-enclosed hood with air-operated doors along the entire front side and sliding panels along the back. The dryer section is equipped with a Dravo-DeLaval lubricating system.

Additional Equipment

Auxiliary equipment installed during the Bowaters machine project includes: Open-side calender stack with a 40-in. bottom rolls and seven 18-in. intermediate rolls — **Beloit Iron Works;** pneumatic reel — **Beloit;** heavy-duty unwind stand with pneumatic ejector; dry end broke disintegrator — **E. D. Jones & Sons Co.;** 6000-fpm winder with 24-in. drums, shear slitters and motor-driven rider roll — **Beloit;** paper machine drive — **General Electric Co.**

Automatic roll-wrapping unit — **Stadler-Hurter & Co.;** turbo-generators supplying 20,000 kw — **General Electric;** power boiler (350,000 lb. steam per hour at 850 psig and 900°F) — **Babcock & Wilcox Co.**

Time Inc. and CZ Join Forces to Build Louisiana Mill

Pioneering new techniques of double-coating printing papers at high speeds on the machine will be undertaken at a $31,000,000 mill that will be built at St. Francisville, La., as a joint effort of Crown Zellerbach Corp. and Time Inc. The firm will be known as St. Francisville Paper Co.

About 27 miles north of Baton Rouge on the Mississippi River, the plant will be managed by Crown Zellerbach. One high-speed printing paper machine with an annual capacity of 78,000 tons is scheduled to be in operation by the latter part of 1958. Half of the output will go to Time, while the remainder will be marketed by CZ in the Midwest and East.

Referring to the double-coating process, G. E. Young, vice president for CZ's printing paper sales, declared, "This should produce an unusually high quality printing paper to help satisfy increasing demands by magazine and other publishers."

The St. Francisville mill will draw on a wide variety of white southern hardwoods that have previously had little economic use.

CZ Borrows $60,000,000

Crown Zellerbach also recently announced that it has concluded arrangements for a $60,000,000 25-year loan in the form of promissory notes with a group of institutional investors. The money will help finance CZ's continuing program of selective expansion that is expected to increase capacity by 425,000 tons (26 per cent) over a five- to seven-year period.

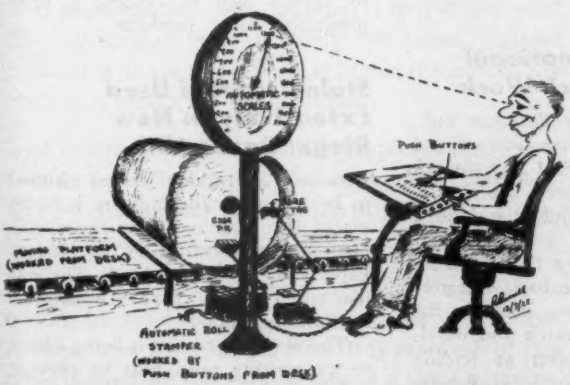
In a statement to stockholders, A. B. Layton, president of the firm, had this to say: "We have financed most of our $320,000,000 postwar expansion and modernization program out of our own resources. And we are continuing this policy, supplementing our own resources by borrowing only to the extent necessary to maintain our position as one of the leaders in the nation's third fastest growing industry.

Time Sells St. Regis Stock

In one of the biggest secondary stock offerings in recent months, Time has put up for sale 350,000 shares of St. Regis Paper Co. common. It is estimated that after taxes the magazine publisher will realize a profit of about $6,000,000.

While no announcement had been made by Time, some sources speculated that it is selling the stock to obtain cash toward an ambitious capital spending program recently launched. The publisher originally acquired 250,000 St. Regis shares a

28 Years Later: Prophetic Cartoon Almost Hits Bull's Eye



"A ROLL BUCKER'S Dream of Paradise" was the title given to the above cartoon 28 years ago by a former employee of Powell River Co. Ltd. How close he came to 1956 fact is shown at the right, wherein is pictured the semi-automatic roll-handling system introduced at the mill recently. (see The PAPER INDUSTRY for September, page 484).

PHASES OF DRYDEN'S expansion project now nearing completion. Barkers in the new woodroom (l) handle rough wood delivered to the mill by truck. Piping and equipment installation on the lower floor of the bleach plant (c) was to be ready for operation early this year. Interior view of causticizer building (r) shows the drogs washer, green liquor clarifier and causticizing tanks.

Dryden Expansion and Modernization Increases Pulp and Paper Output

Now nearing completion at Dryden Paper Co. Ltd. in Dryden, Ont., is an expansion program that will increase the annual production of pulp and paper from 72,000 to 142,000 tons. In addition, early 1957 will bring the production of bleached sulfate for the first time in the firm's history.

The new causticizing plant using the Dorr continuous system has been in operation for some time, and the remodeling of No. 1 pulp machine was nearly completed early in December. The new woodroom is operating, and wood-handling and chip conveyors have been installed. Well underway is the installation of equipment at the new chemical preparation building, washer building and five-stage chlorine dioxide bleach plant at Dryden mill.

Among suppliers of equipment to the project were: **Dorr-Oliver Long Ltd.** (causticizing tanks); **Horton Steel Works Ltd.** (barking drums); **Dominion Welding Engineering Ltd.** (stainless steel stock and water piping); **Canadian Stebbins Engineering & Mfg. Co. Ltd.** (lining for Kamyr design bleach towers), and **Canada Pumps Ltd.** (pumps).

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decade ago in exchange for three paper mills that it sold to the pulp and paper manufacturer. Time had bought the mills and had operated them for a short period following World War II to assure itself sufficient paper during the postwar shortage.

Rayonier-Hammermill Merger Discussed

"Conversations" on a possible merger of Hammermill Paper Co. and Rayonier Inc. have been underway "for some time", according to Clyde B. Morgan. Morgan, who is president of Rayonier, refused to elaborate on the statement.

Hammermill presently owns 364,000 shares of Rayonier common, or 6.6 per cent of that company's outstanding shares.

WTCo Buys Southern Woodlands; No Mill Plans Immediate

Weyerhaeuser Timber Co. of Tacoma, Wash., has purchased options on 90,000 acres of reforestation lands in Mississippi and Alabama. Located in the Columbus, Miss. area, the lands were held by Mississippi Pulp & Paper Co. and other local owners.

A spokesman for the Washington firm reported that plans do not include the construction of a pulp and paper mill in the immediate future. "With an intensive rehabilitation program," he said, "we believe these lands can be brought back into fair productivity to ultimately support new local plant capacity.

". . . The lands include shortleaf and loblolly pine stock. They have all been heavily logged. Some have been repeatedly burned. We estimate that we will have to spend at least $10 per acre to reestablish productive capacity."

Mississippi Pulp & Paper represented a group of container board manufacturers who had originally planned to locate in the area. It held more than 60 options on forest lands within a 60-mile radius of Columbus. Weyerhaeuser purchased the options but neither the assets nor the stock of the company.

Canadian International Extends Research Work

Industrial Cellulose Research Ltd., a subsidiary of Canadian International Paper Co., has extended its activities into the field of basic cellulose research. Industrial Cellulose is located at Hawkesbury, Ont.

Although in the past the laboratory has done considerable basic research, its activities have been more in the phase of applied research and development with the object of finding more and improved uses for dissolving pulp.

Heading the new department is Dr. Hans Kraessig, who was formerly associated with Prof. Herman Staudinger at the University of Freiburg in Germany.

Allied Paper to Build Semichemical Pulp Mill

Allied Paper Corp. is planning to construct a semichemical pulp mill in Kalamazoo, Mich., at a cost of $4,000,000 to $7,000,000. A final decision on the plant's size has not been reached, but its daily capacity of high-yield hardwood pulp will be between 100 and 200 tons.

The plant will add about $1,000,000 annually to Allied's profits, according to Arnold H. Maremont, board chairman. It is the first step in the firm's plan to become a fully integrated paper producer.

Stainless Steel Used Extensively in New Riegel Paper Mill

A stock preparation system claimed to be unique in the industry is to be placed in operation at the paper mill now under construction by Riegel Paper Corp. in Acme, N. C. The system will comprise Type 316 stainless steel throughout.

The new paper plant is being added to an existing pulp mill to provide a fully integrated operation at Acme. It represents part of a $14,300,000 expansion program now underway in the firm's southern properties. Output

Portrait

of the "Backbone" of a Papermaker's Felt

Pictured here is what might be called the "backbone" of a papermaker's felt. Actually, it is a single wool fiber, magnified approximately 800 times. Twisted together with countless similar fibers, it provides the yarn from which the felt is woven.

Look closely... and note the overlapping scales found only on certain animal fibers, which permit what feltmakers call "fulling". It is during this essential operation that our *custom-engineered* fabrics become felts.

Huyck's study of wool fibers and their "fulling", or felting characteristics, results in more uniform, stronger and better fitting felts. It is research of this type, backed by the expenditure of a very high percentage of our sales dollar, which has established Huyck's leadership and makes *NEW HUYCK FELTS* a must in the production of better paper at lower felt cost per ton.

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Arnprior, Ontario • Established 1918

will consist of bleached paperboard at a daily rate of from 200 to 250 tons. Three types of furnish are to be used: bleached kraft, unbleached kraft and sulfite semichemical.

The stock preparation equipment is being engineered and designed by the Shartle Div. of Black-Clawson Co. at Middletown, Ohio. Stainless steel was selected for extreme cleanliness, acid-resistance and long life.

Two B-C continuous Hydrapulpers, one at each calender stack, will handle broke. A batch-type Hydrapulper will be used to break up baled pulp from storage. Automatic control of the system will be afforded by a centralized remote panel.

Multimillion Dollar Program Reported by Union Bag-Camp

A three- to four-year expansion and modernization program costing several million dollars has been announced at the Savannah, Ga. plant of Union Bag-Camp Paper Corp.

Highlighting the project — aimed primarily at an increase in production — will be the installation of the plant's seventh paper machine. The unit's primary production will consist of lightweight kraft papers. Its design speed will be 2500 fpm maximum.

Other major items in the expansion program will include:

1. A hardwood pulp mill with digesters, pulp washers, storage facilities and refining equipment and a daily productive capacity of about 300 tons; a pond (28,000-cord capacity) for the underwater storage of pine pulpwood.

2. Expansion of the present woodyard and wood room, consisting of new barking drums, a new chipper, screens and a chip storage silo.

3. The installation of a new lime kiln, recovery furnace, black liquor evaporators and pulp washing facilities, (in addition to such equipment planned for the new hardwood pulp mill).

4. A turbo generator — the eighth to be installed in the Savannah plant — having a capacity of approximately 25,000 kw; a combined bark- and natural gas-fired high-pressure power boiler.

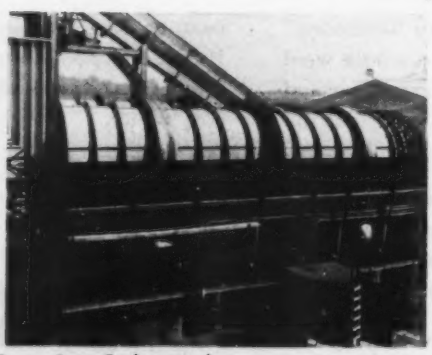
5. An electronically-controlled automatic conveyor system for the movement of large rolls of kraft paper and paperboard from the machine directly to warehouse or shipping.

Convert Logs into HIGH-QUALITY CHIPS

with Carthage Log Barkers, Log Splitters, Log Chippers, Slab Chippers, Chip Screens

For example:

CARTHAGE BARKING DRUMS thoroughly remove the bark with minimum brooming of the logs. Heavy, all-welded design with full-length plates results in long service life and low maintenance.



Write for Complete Information

CARTHAGE MACHINE COMPANY CARTHAGE, NEW YORK

News of the Industry . . .

6. Other proposed additions are to include the enlargement of the roll storage wells in the box plant; additional storage space in the dock area, and new offices for the box plant sales staff.

Discussing the hardwood pulp mill, Board Chairman Alexander Calder declared, "This new installation will enable the plant to use greatly increased quantities of those hardwood types for which there is little or no market at the present time." The plant now consumes an annual 75,000 cords. It is estimated that eventual consumption will total 250,000.

Subject Announced for 10th Bolton Contest

Co-sponsors of the annual Bolton Award essay contest—the Superintendents Association and John W. Bolton & Sons Inc.—have announced that the subject for the 10th Annual Bolton Award competition will be, "My Responsibilities to the Others in my Company".

The grand prize is $1000; second prize $750; third prize $500, and seven prizes of $200 each.

The contest ends at midnight on March 31. All papers are to be mailed to: Harry Weston, secretary-treasurer, American Pulp & Paper Mill Superintendents Association, 327 South LaSalle St., Chicago 4. Judging is on the basis of the value, interest and originality of the ideas rather than on writing skill.

Competition is open to all employees of pulp and paper mills in North America. Papers should be confined to 1500 words and typed with double spacing on 8½- by 11-in. sheets. Cover sheets are only to include name, position or duties, mill and both the business and home addresses.

Rosy Future Seen at NPA Convention

That the paperboard industry is preparing to meet the fast-growing demand predicted for the next several years was the theme of the annual convention of the National Paperboard Association held recently in New York, N. Y. The probable increase in capacity by 1959 stands at 23 per cent.

Elected new president of the association was J. R. Kennedy, president of Federal Paper Board Co. Inc. He

succeeds T. N. Bland of Fibreboard Products Inc.

Principal subjects for discussion at the meeting were new methods of production, the discovery or development of new uses for paper and a reduction in the cost of pulpwood.

Discussing the raw material picture, W. S. Bromley, secretary of the American Pulpwood Association, pointed out that the 1956 pulpwood consumption was likely to exceed 34,500,000 cords, more than 9 per cent above the 1955 figure.

Members of the NPA, the convention was told, produced 12,000,000 tons for the first 10 months of 1956, higher than any full year prior to 1953.

New vice presidents of the association are H. L. Wollenberg, of Longview Fibre Co. and Sture Olson of Chesapeake Corp. of Virginia. Harry S. Adler announced his retirement as secretary. He was succeeded by Merritt C. Thiem.

MacMillan & Bloedel Calls Seed-bearing Cone Experiment Successful

Douglas fir trees on experimental plots belonging to MacMillan & Bloedel Ltd. have been brought into spectacular seed-bearing cone production following artificial stimulation by chemicals and growth hormones.

In 1956, at an elevation of 2000 ft. near Duncan, B. C., there was no natural seed. Artificial stimulation produced a bumper crop. Cones from the treated trees were larger than natural cones and contained twice as much seed. At other locations on Vancouver Island similar tests have been successful on a range of elevations and tree sizes. (Natural cone crops are infrequent at elevations above 1000 ft.)

Western Michigan's New Laboratory Dedicated

Western Michigan College at Kalamazoo has formally dedicated its new paper laboratory. Held in conjunction with the ceremonies was a joint meeting of Kalamazoo Valley Tappi and the Michigan Div. of the Superintendents Association.

Speakers during the day-long festivities were to include: Bert H. Cooper, vice president of Kalamazoo Paper Co. and chairman of the school's paper technology advisory committee; Gerald A. Hale, assistant to the executive vice president of Minerals & Chemicals Corp. of America; Dr. Clair L. Taylor, state superintendent of public instruc-

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tion; Paul V. Sangren, college president; Dr. Clarence E. Libby, head of the pulp and paper technology curriculum at North Carolina State College, and James A. Wise, president and general manager of Kalamazoo Paper.

Northwest Mills Form Permanent Organization

Representatives of 16 pulp and paper companies with 28 mills in Washington and Oregon have formed a permanent research and educational organization under the name Northwest Pulp & Paper Association.

The new group will report on pulp and paper's growing economic and social importance in the Northwest and coordinate and fully utilize the industry's research and engineering developments in air and water pollution abatement.

President of the new association is Howard W. Morgan, vice president and manager of the Pulp Div. of Weyerhaeuser Timber Co.; vice president, R. S. Wertheimer of Longview Fibre Co., and secretary-treasurer, Lawson P. Turcotte of Pudget Sound Pulp & Timber Co. Headquarters are in Tacoma.

Executive secretary is Vinton W. Bacon, for the past six years executive officer of the California State Water Pollution Control Board.

Member firms include Columbia River Paper Mills, Oregon Pulp & Paper Co., Crown Zellerbach Corp., Fibreboard Prdoucts Inc., Inland Empire Paper Co., Longview Fibre Co., Publishers' Paper Co., Puget Sound Pulp & Timber Co., Rayonier Inc., Scott Paper Co., Coos Bay Pulp Corp., St. Regis Paper Co., Simpson Paper Co., Western Kraft Corp., West Tacoma Newsprint Co. and Weyerhaeuser Timber Co.

Recent Expansions in the Industry

St. Regis Paper Co.
has announced that it has declared effective the exchange of stock through which it acquires J. Neils Lumber Co. of Portland, Ore. The Oregon firm operates sawmills at Klickitat, Wash., and at Libby and Troy, Mont. In connection with the acquisition, St. Regis plans the construction of a pulp and paper mill in the Montana area and will install barkers and chippers at Neils mills, thus making them an important source of wood chips for St. Regis' plant in Tacoma.

Orchard Paper Co.
of St. Louis has purchased Associated Paper Converting Corp. of Los Angeles, a manufacturer of bag and printed roll specialties. This is the second major acquisition by Orchard in the last two years, having merged in 1955 with Racquette River Paper Co. of Potsdam, N. Y.

Diamond Match Co.
will spend approximately $2,000,000 over the next 12 months to step up production of molded pulp products at Ogdensburg, N. Y. A semi-commercial pilot plant will be installed at the sulfite mill for research toward using local hardwood timber in the pulp molding operation.

Abitibi Power & Paper Co. Ltd.
has surveyed timber stands in the Moak Lake area of northern Manitoba with an interest in the pulpwood prospects of the region. According to the Hon. F. L. Jobin, provincial minister of commerce, prospects of pulpwood operations have been greatly improved with the decision of International Nickel Co. to go ahead with its $175,000,000 development at Moak Lake. This would mean the creation of a hydro site on the Nelson River that would make extra power available for a pulp mill.

Longview Fibre Co.
at Longview, Wash., will install the largest capacity power generating unit ever ordered by a pulp and paper manufacturer in the Northwest. Constructed by the Medium Steam Turbine, Generator and Gear Department of General Electric Co. at Lynn, Mass., the steam turbine is of the tandem, non-reheat type using steam at 800 psig at 750° F. Steam will be automatically extracted at 175 psig for process operations.

SEVEN machine drives recently installed on Mead Corp.'s No. 3 at Chillicothe, Ohio. The units were supplied by Patton Mfg. Co. Inc.

Papelera Pulpa Cuba S. A.
has contracted with Parsons & Whittemore Inc. to supply equipment for a completely integrated bleached bagasse pulp and paper mill to be built at Central Trinidad on Cuba's southern coast. The plant will be the largest and most modern of its kind in the world and will cost an estimated $12,000,000 to $14,000,000. The Black-Clawson Co., a P&W affiliate, will supply the paper machine and related equipment.

Charmin Paper Mills Inc.
stockholders at Green Bay, Wis., have approved the acquisition of substantially all Charmin assets by Procter & Gamble Co. of Cincinnati. Involved is an exchange of stock. Charmin's operations will be continued as an integrated unit of P&G through a new subsidiary, Charmin Paper Products Co.

W. R. Grace & Co.
has purchased through a subsidiary the properties and physical assets of Industrias M. J. Dias y Cia of Havana, Cuba. The latter firm, a leading Cuban converter, produces a wide variety of paper containers and cellophane wrappers. The move is part of Grace's $46,000,000 expansion program in the paper industry in Latin America.

River Raisin Paper Co.
of Monroe, Mich., has purchased industrial property at Eaton Rapids. After remodeling, the two buildings will be equipped with machinery for the production of fiber shipping containers.

Hammermill Paper Co.'s
proposal for the construction of a pulp mill in the Franklin-Oil City area of western Pennsylvania may be submitted to a "public airing" in regard to possible pollution of the Allegheny River. The demand for such a hearing was made by the Allegheny County Sanitary Authority.

Carton Craftsmen Inc.
of Chicago has purchased the assets and business of the Waters Co., also of Chicago, a manufacturer of folding cartons. The newly acquired firm will operate as a division of Carton Crafts-

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- inherent self-alignment
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- long, smooth service life
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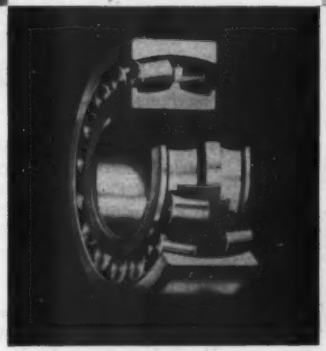

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Roller end and flange surfaces alike are ground to a common spherical radius centered on the common vertex of bearing axis and roller axis. Under all load conditions, the rollers bear lightly but constantly against this flange. This guides the roller positively with minimum friction and prevents skewing. Stress concentrations leading to early failure are avoided, so the bearing will serve you many good turns longer.

This is the kind of feature Torrington builds into its bearings out of its experience with all major types serving in all kinds of equipment. Care for such details is matched only by our care in mating the *right* bearing to the *right* job. In this, your Torrington representative is an expert: call on him when you need help. *The Torrington Company,* South Bend 21, Ind.—Torrington, Conn.

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News of the Industry . . .

men, a wholly owned subsidiary of Cornell Paperboard Products Co. of Chicago.

Arkell & Smiths
has completed an extensive modernization and expansion program at its Wellsburg, W. Va. multiwall bag plant. Materials handling operations were improved, a paper warehouse constructed and facilities expanded to accommodate new equipment.

Albemarle Paper Mfg. Co.
of Richmond, Va., plans the purchase of Tredegar Co., historic iron works and munitions maker in five wars.

Celanese Corp. of America
has acquired a direct financial interest in Columbia Cellulose Co., a wholly owned subsidiary of Canadian Chemical & Cellulose Co. (Celanese Corp. is the parent firm of CC&C.)

Little Rapids Pulp Co.
of Green Bay, Wis., has announced that Green Bay Tissue Mills has been dissolved to become a division of the parent firm. No personnel changes are planned.

Bird & Son inc.
will build a three-story administration building at East Walpole, Mass. The 50,000-sq. ft. structure will contain executive conference rooms and an employee cafeteria. Completion is scheduled for early next year.

Ellis E. Patterson & Associates
of Studio City, Cal., has obtained a 12,000-acre timber option in northwestern Saskatchewan and is considering the construction of a pulp mill in the area. Plans for the province's second mill are yet in the preliminary stage.

Prairie Fibreboard Ltd.
is proceeding on schedule with its $3,000,000 insulating board and hardboard plant now under construction at Saskatoon, Sask. Initial annual capacity of the facility, expected to be in operation in the spring, will be some 30,000,000 sq. ft.

New York & Pennsylvania Co.
plans to move its executive and sales offices to new and larger quarters in New York, N. Y. Location of the headquarters will be at 425 Park Ave., where the firm will have the entire 17th floor.

McLaurin-Angier Co.
of Needham Heights, Mass., has become Ludlow Papers Inc. The new firm, a wholly owned subsidiary of Ludlow Mfg. & Sales Co., is an amalgamation of three companies in the field of paper converting: McLaurin-Jones Co. of Brookfield and Ware, Mass., and Homer, La.; Angier Corp. of Framingham, Mass., and Stocker Mfg. Co. of Netcong and Stanhope, N. J.

Weyerhaeuser Timber Co.
has announced that it has reached an "oral agreement" for the purchase of W. A. Woodard Lumber Co. at Cottage Grove, Ore. Included in the transaction are large timber holdings, logging equipment and a sawmill and a plywood mill.

A Multimillion Dollar Pulp Mill
may be built at Taylor in the Peace River region of northern British Columbia, according to Ray Williston, provincial lands and forest minister.

Allied News Notes . . .

Signode Steel Strapping Co. recently purchased patents relating to paperboard expendable pallets owned by Materials Handling Laboratories Inc.

Morningstar, Nicol Inc. has dedicated new plant facilities in Hawthorne, N. J., that give it "the most modern setup in the world" for the grinding, blending, treating and compounding of water soluble gums.

Lithcote Corp. has leased additional space in Norwalk, Conn., for the increased production of protective coatings. Lithcote has also recently licensed additional applicators throughout the United States and Canada.

Fisher Governor Co. has announced a new sales representative for Boston and New England: Clarence B. Petty & Co., 50 Kearney Rd., Needham Heights 94, Mass.

Chicago Bridge & Iron Co. has opened a new sales office in the Pan American Life Bldg., New Orleans, to serve Louisiana and southern Mississippi.

American Cyanamid Co. will build a multimillion dollar plant at Farmville, N. C., for the manufacture of flakeboard.

Chemical Translating Service of Palo Alto, Cal., has announced a new department to handle exclusively translations in the field of pulp and paper.

Fischer & Porter Co. has purchased land in Bucks County, Pa., for expansion of office, laboratory, production and recreation facilities.

Mattison Machine Works of Rockford, Ill., has purchased the machine tool division of Mercury Engineering Corp., Milwaukee.

Carpenter Steel Co.'s Alloy Tube Div. has named McJunkin Corp. as distributor in the Pittsburgh area.

Monsanto Chemical Co. and **Emery Industries Inc.** have joined in the manufacture of chemicals from crude tall oil.

E. I. du Pont de Nemours & Co. will build a plant in New Jersey for the production of sodium carboxymethylcellulose.

R. T. Vanderbilt Co. has moved its Kalamazoo, Mich. offices to 125 West Walnut St.

Coming Events

Tappi

Feb. 18-21—Forty-second Annual Meeting, Hotel Commodore, New York, N. Y.
March 12—Lake States Section, Appleton, Wis.
March 22-23—Southeastern Section, Charleston, S. C.
April 5—Pacific Section, Everett, Wash.
April 9—Lake States Section, Milwaukee
May 20-23—Eighth Coating Conference, Pfister Hotel, Milwaukee
May 24-25—Southeastern Section, Savannah, Ga.
May 30-June 1—Pacific Section (joint meeting with Superintendents), Gearhart, Ore.

Superintendents Association

March 26—Miami Valley Div., Manchester Hotel, Middletown, Ohio
April 4-5—Michigan Div. (joint meeting with Kalamazoo Valley Tappi), Dow Chemical Co., Midland, Mich.
April 27—Michigan Div., Hotel Harris, Kalamazoo
April 30—Miami Valley Div., Manchester Hotel, Middletown, Ohio
May 10-11—Penjerdel Div., Hotel Stacy-Trent, Trenton, N. J.
May 16—Michigan Div., Hotel Harris, Kalamazoo

Other meetings

Feb. 18-21—American Paper & Pulp Association, annual meeting, Waldorf-Astoria Hotel, New York, N. Y.
March 10-12—National Association of Waste Material Dealers Inc., annual convention, Conrad Hilton Hotel, Chicago
March 31-April 4—Folding Paper Box Association, annual meeting, Drake Hotel, Chicago
May 1-3—National Paper Box Manufacturers Association, annual convention, Eden Roc Hotel, Miami Beach

"CAMERON helps us to plan for the years ahead"

. . . says J. W. D. Hierlihy, Mill Manager, Fraser Paper, Ltd., Madawaska, Me.

J. W. D. "JACK" HIERLIHY

. . . "to stay ahead of the pace we buy equipment larger and faster than needed. Speeds which seem excessive now may well be normal within a few years.

. . . "our new Imperial now runs at 4,500 fpm maximum normal speed. It's reserve capacity is 6,000 fpm.

. . . "Cameron's new slitter assembly has reduced the time loss on slitter changes by at least 50%.

. . . "the Imperial's faster, easier set-up and high running speeds permit greater production of top-quality rolls with an extreme variation of width and diameter".

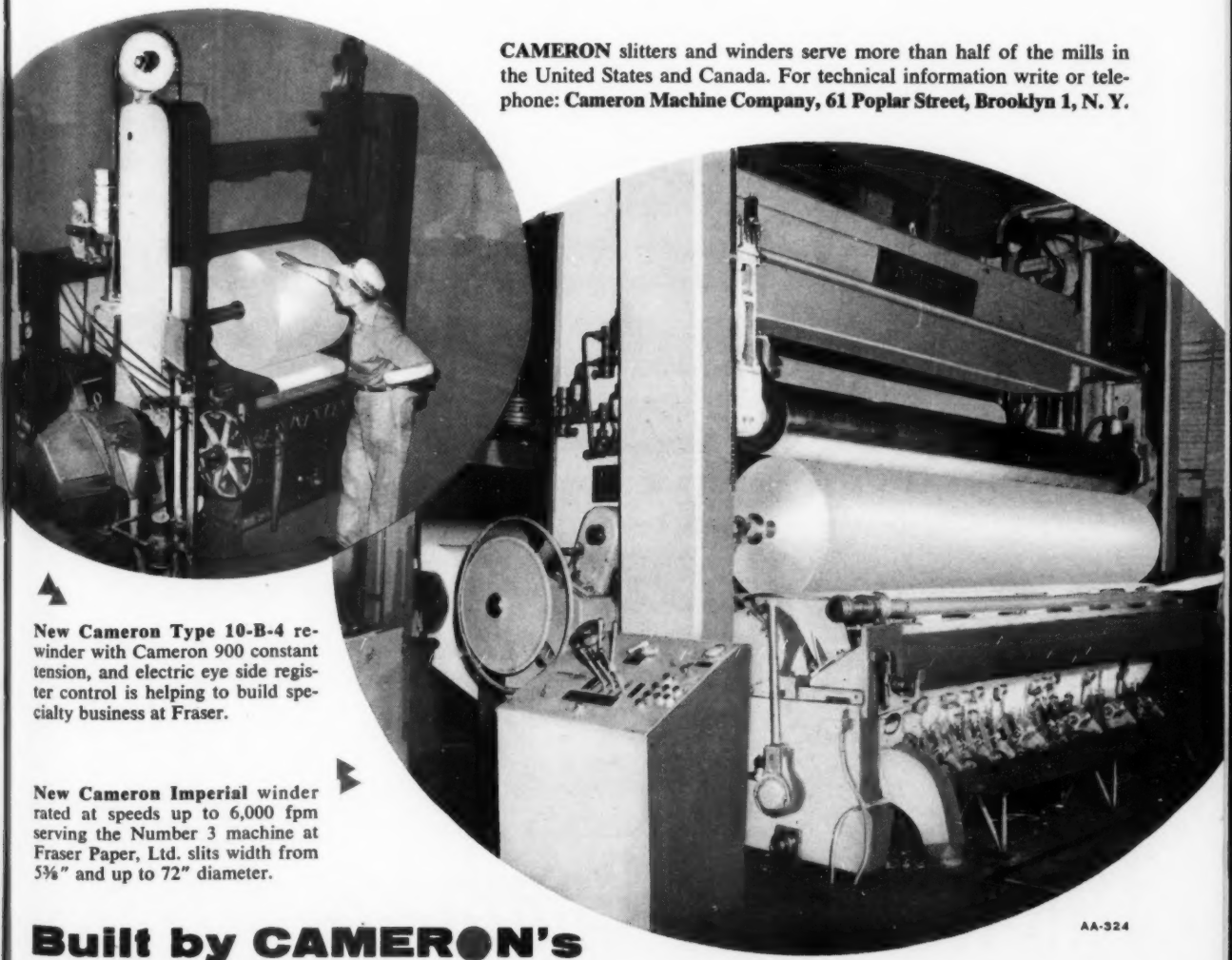
"Better Service for Our Customers"

. . . "with its ability to slit and wind rolls to almost any specification, the Cameron Type 10 has opened a new area of business for Fraser Paper, Ltd.

. . . "the Type 10, with electric eye, can reclaim telescoped or offset rolls without trimming, at speeds up to 2,000 fpm. This means substantial savings.

. . . "we have, ready for installation, another Cameron of larger capacity and greater speed to join the Type 10 in providing quicker service to our customers".

CAMERON slitters and winders serve more than half of the mills in the United States and Canada. For technical information write or telephone: **Cameron Machine Company, 61 Poplar Street, Brooklyn 1, N. Y.**



New Cameron Type 10-B-4 rewinder with Cameron 900 constant tension, and electric eye side register control is helping to build specialty business at Fraser.

New Cameron Imperial winder rated at speeds up to 6,000 fpm serving the Number 3 machine at Fraser Paper, Ltd. slits width from 5⅜" and up to 72" diameter.

AA-324

Built by CAMERON's team of specialists

...for superior paper at no extra cost

Use OK BRAND Starches

the complete paper mill line

	Wet-End Additives	Press & Tub Sizes	Coating Adhesives	Calender Sizes
KEOJEL	●			
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KEOCOTE			●	
PEARL	●			
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There's an OK Brand product especially formulated for every paper mill operation requiring starches and adhesives ...and there's no extra cost for these top-quality OK BRAND products.

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NAMES in the NEWS

Harrison F. Dunning

Paul C. Baldwin

Scott Executives Get New Responsibilities

Scott Paper Co. at Chester, Pa., has reported that Harrison F. Dunning and Paul C. Baldwin, vice presidents and directors, and Forrest W. Brainerd, assistant vice president, have assumed new responsibilities.

Dunning, who joined the firm as a salesman in 1935, becomes executive director of merchandising activities for all Scott retail brands. Baldwin, in addition to continuing his direction of engineering, research and development, will assume responsibility for all manufacturing. Brainerd, who has been handling special management assignments, becomes Baldwin's executive assistant.

Brother Succeeds J. P. Weyerhaeuser

Frederick K. Weyerhaeuser of St. Paul, Minn., has been elected president of Weyerhaeuser Timber Co. to succeed his late brother, J. P. Weyerhaeuser Jr., who died in December after a brief illness.

Weyerhaeuser retains his chairmanship of the timber company's board of directors and the presidency of Weyerhaeuser Sales Co.

Charles H. Ingram, veteran executive of the firm, a vice president and general manager, was elected executive vice president.

Weyerhaeuser is a native of Rock Island, Ill., and a graduate of Yale University. Following army service during World War I as a flyer, he became a representative of Weyerhaeuser Sales and in 1921 was appointed assistant to the sales manager of Snoqualmie Falls Lumber Co. In 1929 he became president of the sales firm and in 1955 was elected president of Weyerhaeuser Timber.

Leslie P. Hill

George A. Johnson

KVP Staff Changes

Supervisory changes have been announced by the Paper Manufacturing Div. of KVP Co. at Kalamazoo, Mich.:

Leslie P. Hill, who has been with the firm since 1924 and most recently as assistant superintendent of No. 2 paper mill, has been named superintendent of No. 1 mill to succeed George A. Johnson. Johnson retired December 31.

Alfred B. Perlick, supervisor of beater rooms, bleach plant and unloading, succeeds Hill as assistant superintendent of No. 2 paper mill. He has been with KVP since 1926.

K-C Names Seaborne

F. S. Seaborne has been elected executive vice president and director of all Kimberly-Clark Corp. operations in Canada. The action integrates all Canadian activities under one central headquarters in Toronto.

Seaborne has been associated with Kimberly-Clark since 1923. In returning to Canada he will continue as a corporation vice president and member of the board of directors.

St. Regis Appointments

The following personnel changes have been announced at the Jacksonville, Fla. mill of St. Regis Paper Co.:

J. A. Harrison, formerly pulp mill superintendent, to assistant general mill superintendent; L. E. Goodwin, assistant pulp mill superintendent, to pulp mill superintendent; J. B. Thomas, tour foreman, to assistant pulp mill superintendent; J. L. Green, assistant power house superintendent, to instrument engineer; A. K. Davis, shift engineer, to assistant chief power engineer, and W. R. Gray, purchasing clerk, to assistant purchasing agent.

R. A. McDonald

Wentworth Brown

W. R. Grace & Co. has announced the election of **Richard A. McDonald** as a director and the appointment of **Wentworth Brown** as head of the Paper Div. of the Latin American Paper & Chemical Group. McDonald was formerly executive vice president and chairman of the executive committee of Crown Zellerbach Corp. and was recently retained by Grace as a consultant on paper. Brown was previously vice president of Canadian Chemical & Cellulose Co. Ltd. and vice president and general manager of its two subsidiaries, Columbian Cellulose Co. Ltd. and Celgar Ltd.

U. C. Shropshire, a specialist in the lamination of foil board for the folding box industry, has been named laminating superintendent for Gummed Products Co. of Troy, Ohio, a subsidiary of St. Regis Paper Co.

Nine men have been appointed to the program committee for the forthcoming Eighth Annual Tappi Coating Conference that will be held in Milwaukee May 20-23: **W. H. Aiken,** Gardner Board & Carton Co.; **R. W. Hagemeyer,** Wyandotte

Chemicals Corp.; H. Kohne, West Virginia Pulp & Paper Co.; **R. W. Martinek,** Kimberly-Clark Corp.; **G. S. McKnight,** Oxford Paper Co.; **A. W. Neubauer,** Crown Zellerbach Corp.; **E. R. Padavic,** Container Corp. of America; **C. W. Steele,** Champion Paper & Fibre Co., and **W. E. Welliver Jr.,** New York & Pennsylvania Co.

Adrien Croteau

Nazaire Metivier

Adrien Croteau, assistant superintendent since 1952, has been named superintendent of the kraft pulp mill of Brown Co. at Berlin, N. H. **Nazaire Metivier,** tour foreman, succeeds Croteau as assistant superintendent.

J. R. Atwater, for 27 years associated with Mead Corp., has joined P. H. Glatfelter Co. as assistant to the president.

J. R. Atwater

W. S. Hunter

William S. Hunter, formerly a project engineer at Tyrone, has been named assistant to the chief plant engineer at the Williamsburg, Pa. mill of West Virginia Pulp & Paper Co.

George C. Gibb, manager of employee and community relations at the International Falls, Minn. mill, has been appointed director of industrial relations for Minnesota & Ontario Paper Co. He succeeds **George N. Williams,** who resigned recently.

Fred E. Bahrenburg, with the firm since 1948 and general superintendent since 1955, has been named to the newly created position of plant manager for Hammermill Paper Co., Erie, Pa. Succeeding him as general superintendent is **Robert S. Young,** formerly manufacturing superintendent. In another Hammermill appointment, **Robert W. Arentson** of the standards section becomes production manager.

Names in the News . . .

Carl E. Braun, vice president and mill manager of Publishers' Paper Co. at Oregon City, Ore., has retired, ending a 38-year career in the pulp and paper industry of the Northwest.

Harold Womack, formerly acting superintendent, has been named paper mill superintendent at Longview Fibre Co. in Longview, Wash. **Arthur S. Parson** has been named bag plant superintendent. He was previously assistant superintendent.

The Paper Container Div. of Continental Can Co. has announced three plant manager appointments: **J. H. Taylor,** formerly divisional manager of manufacturing, is now plant manager at Three Rivers, Mich.; **L. M. Gibbs,** formerly at Memphis, now at Kensington, Conn., and **C. H. Dumenil,** formerly at Memphis, now at Three Rivers. **G. H. Barker,** formerly plant manager at Kensington, becomes assistant to the division vice president.

Frederick B. Wardwell, technical assistant to the superintendent since January 1956, has been promoted to mill superintendent of the Riverside mill of Brown Co. in Berlin, N. H. And **Charles Ray,** papermaking superintendent, has been given the post of production superintendent.

Tom Cauter has been named director of marketing for the paper division of the Latin American Paper and Chemical Group of W. R. Grace & Co. He was previously with British Market Research Bureau Ltd.

Dr. Kenneth A. Arnold, technical director of the Central Technical Department of St. Regis Paper Co., has been transferred to the New York office. He was previously located at Deferiet, N. Y.

Rear Admiral **Roy H. Callahan** (USNR ret.) has been elected president and director of Doeskin Products Inc. An attorney, Callahan succeeds **Emanuel Katz,** who has resigned.

Roy H. Callahan

G. V. Bayly

G. V. Bayly, general manager of the Carton Div. of Ohio Boxboard Co., has been elected vice president.

Allied Personals . . .

Peter M. Hartig has been named assistant vice president of Central National Corp. of New York, N. Y., a member of the Gottesman Organization, pulp and paper exporter.

Hubinger Co. of Keokuk, Iowa, has reassigned two technical service representatives: **Milt Barbe,** who has been with the firm 12 years, will headquarter in New Jersey and serve Atlantic coastal states, while **Carroll Taylor** will headquarter at the home office and serve Midwestern paper and corrugating industries.

Louis W. Werthman, manager of the inside sales department, has been named sales manager for the San Francisco Bay area plant of Joseph T. Ryerson & Son Inc.

Richard T. Yates has been elected president of Hawthorn Chemical Corp., a new firm organized by Hercules Powder Co. and Imperial Chemical Industries Ltd. to build and operate a plant for the production of methyl methacrylate. Yates was formerly on special assignment for Hercules.

Alan C. Burn, formerly with United Glass Bottle Manufacturers Ltd., has been named joint managing director for Black-Clawson International Ltd., London.

L. Paul Lee, sales representative for the alloy and stainless steel departments, has been named manager of stainless steel sales at the Milwaukee plant of Joseph T. Ryerson & Son Inc.

Edwin Lyon, formerly at the Al-

Askania Regulator Company NEWS

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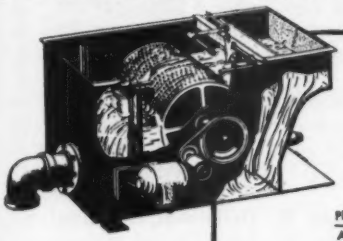
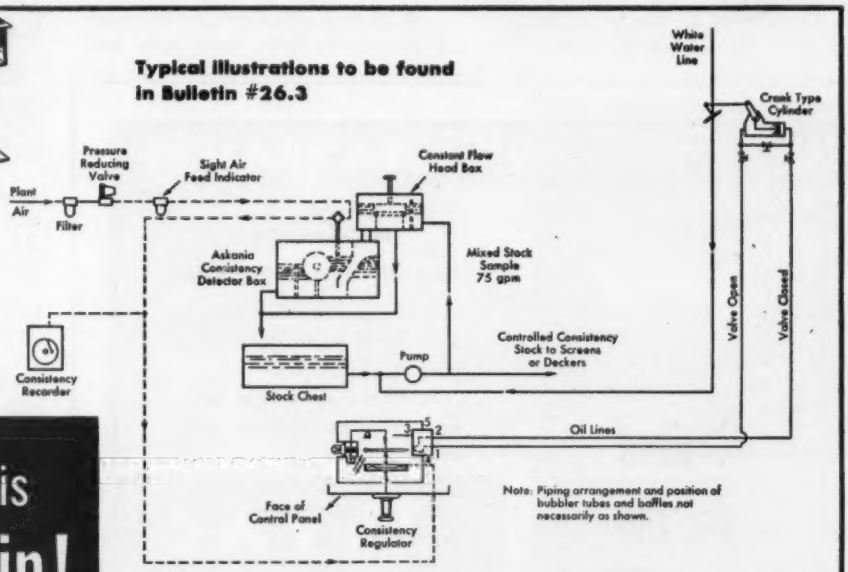


Typical illustrations to be found in Bulletin #26.3



You'll want this New Bulletin!

Shows how exclusive Askania Thin Stock* Consistency Control Systems assure increased production of better quality pulp

ASKANIA REGULATOR APPLICATION BULLETIN #26.3 provides practical information extremely helpful to those interested in automatic control of Consistency, Flow Rate, Stock Level, etc. for *increased production* of better quality pulp.

1 This bulletin shows how ASKANIA'S exclusive control systems and individual control units are easily applied to *both* new and existing pulping processes.

2 By means of diagrams it fully describes the operation of Askania's Automatic Thin Stock Consistency Control systems pointing out the individual components and describing the function of each.

3 It details the results you may expect from the control, such as maximum tonnage, less waste of good fibre, chemical savings, etc.

4 It emphasizes the vital importance of maintaining uniform conditions—and *how* these conditions are achieved with Askania control systems.

5 It cites one example of a 20,000 gallon water savings accomplished by changing a .35% consistency screening to a .5% screening—from which you may be able to evaluate the percentage of pumped water you might save in your own process.

6 It discusses the relationship between drainage rate and consistency detecting.

7 This bulletin carefully describes the functions of the Thin Stock Consistency Detector Box—shows how and why it works as it does.

Practical Information

This bulletin is written to help translate the meaning of ASKANIA Thin Stock Consistency Control in terms of *your own specific problems.*

**0.1 to 1.5% air dry consistency*

Look at a partial list of illustrations:

1 Relationship between Consistency and Frictional Pressure Loss

2 Thin Stock Consistency Control System

3 Stock Level Control System

IF YOU'RE LOOKING FOR CONTROL SYSTEMS which combine sensitivity and durability with powerful, corrective action to achieve continuous control of stock level—

If you're interested in knowing

HOW automatic stock consistency control can be PRACTICAL for you

WHERE Askania Automatic Controls can apply to your processes

WHEN they should be used

WHICH controls should be used to meet specific problems

WHY Askania Automatic Controls will be most efficient and get the best results for you.

Write today, for your copy of ASKANIA REGULATOR APPLICATION BULLETIN #26.3 to Askania Regulator Company, 294 E. Ontario, Chicago 11, Ill.

ASKANIA REGULATOR COMPANY
"CONTROLS FOR INDUSTRY"
HYDRAULIC, ELECTRONIC CONTROLS & SERVOS, GENERAL SYSTEMS, ENGINEERING & COMPUTER SERVICE, VALVE ACTUATORS & CYLINDERS

A SUBSIDIARY OF CPC

bany plant, has been named to the sales engineering staff of Albany Felt Co. to succeed **George Fitch**, who is retiring. His territory includes Maine and parts of Massachusetts and New Hampshire.

S. T. Mackenzie, sales manager of the sales department, has been elected a vice president of Babcock & Wilcox Co. and placed in charge of the sales department of the Boiler Div.

Dr. Charles E. Brockway, formerly with B. F. Goodrich Co., has been named to head a research group at A. E. Staley Mfg. Co., Decatur, Ill.

W. E. Watson has been named general plant manager for Beloit Iron Works.

Robert K. Allen, assistant chief staff engineer, has been appointed superinendent of product development at the Alliance, Ohio research center of Babcock & Wilcox Co.

William C. McClure, field service engineer for New York State and adjoining areas, has been made field assistant to the sales manager of F. C. Huyck & Sons.

A. Howard Smith, formerly of Bausch & Lomb Optical Co., has been named manager of commercial research for Jeffrey Mfg. Co. of Columbus, Ohio.

Claude L. Huey, Atlanta sales engineer for Babcock & Wilcox Co., has been named manager of the Atlantic District to succeed **Paul R. Yopp**, who has retired.

Richard E. Watson has retired as superintendent and treasurer of Wisconsin Wire Works after more than 52 years with the firm.

Lee R. Barlament, technical director, has been elected manufacturing vice president of Appleton Woolen Mills. He joined the firm in 1923 . . . . Appleton Woolen recently honored **Allen B. Thuerer**, secretary, for 46 years' service.

Harry Stilwell has retired as a sales engineer for Albany Felt Co.

A. J. Dubuc has retired as eastern paper mill sales representative for Turner Halsey Co., sales agent for Mount Vernon Mills Inc.

Crane Packing Co. has reported four promotions: **Carl E. Schmitz** from vice president in charge of sales to executive vice president; **Vance E. Vorhees** from assistant general sales manager to vice president in charge of sales; **B. H. Stenberg** from works manager to vice president in charge of manufacturing, and **E. H. Stubenrauch** from divisional sales manager to assistant general sales manager.

Poole Foundry & Machine Co. has announced new executive positions: **S. P. Brady Jr.**, board chairman; **L. M. Ricketts**, president-treasurer; **L. M. Ricketts Jr.**, executive vice president and assistant treasurer; **R. D. Ricketts**, secretary; **G. N. Casciero**, assistant secretary, and **A. E. Swanson**, vice president in charge of engineering.

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"Control Center" Programs

. . . to improve maintenance labor and supervisory efficiency.

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Time Study "Standards"

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. . . with emphasis on quality, both hourly and supervisory, for Pulp, Papermaking and Converting operations.

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Necrology . . .

William B. Gery

William B. Gery, director of the Industrial Technical Div. of Dorr-Oliver Inc., died suddenly January 1.

Associated with the firm more than 30 years, Gery had worked closely with eastern chemical process industries and with pulp and paper manufacturers. He aided in the development and modifications of the Dorr recausticizing system.

Dr. Arthur N. Parrett

Dr. A. N. Parrett

Dr. Arthur N. Parrett, vice president in charge of research and development for Rayonier Inc., died unexpectedly December 27 while on a business trip in Seattle. He was 60.

Dr. Parrett joined Rayonier in 1932 and directed the firm's research and development laboratories at Shelton, Wash., Vancouver, B. C., and Whippany, N. J.

A holder of a Ph. D. from the University of Pittsburgh, he had been associated with E. I. du Pont de Nemours & Co. and A. O. Smith Corp. prior to joining the Rayonier staff.

Earl E. Warner, for almost 40 years an application engineer for General Electric Co., died January 1. For the past 25 years his work was principally concerned with the application of electric drive systems in the pulp and paper industry.

Conrad J. Kern, former president of Moore & White Co. of Philadelphia, died December 19. He retired five years ago after 60 years with the firm.

Raymond E. Stearns, 57, vice president and assistant general manager of United Board & Carton Corp., died in his New York, N. Y. office December 17. He was at one time associated with Empire Box Corp. of Garfield, N. J.

Henry Hill Collins, former president of A. M. Collins Mfg. Co. of Philadelphia (now a division of International Paper Co.), died January 1 at his home in Bryn Mawr, Pa. The firm was founded by his grandfather in 1857.

William McCurdy Leeson, former chief engineer for the Sandy Hill Iron & Brass Works at Hudson Falls, N. Y., died recently in St. Petersburg, Fla., where he had made his home for the past six years.

Charles E. Ackley, 61, paper mill superintendent for Crown Zellerbach Corp. at West Linn, Ore., died in Green Bay, Wis., in November while on a business trip.

Calvin A. Agar, 69, a director of International Paper Co., and at one time president of Agar Mfg. Co., died recently at his New Jersey farm. He sold Agar Mfg. to International in 1941.

George Frederick Jewett, 60, board chairman of Potlatch Forests Inc. and widely known Northwest business executive, died in November at Spokane, Wash. He was at one time general manager of Edward Rutledge Timber Co.

Dr. Raphael Zon, leader in the establishment of national forests and father of the shelter belt program for the Great Plains, died recently in Minneapolis.

Leonard N. Smith, for 28 years superintendent of the Pearl City mill of American Tissue Mills until his retirement in 1945, died in December at Springfield, Mass.

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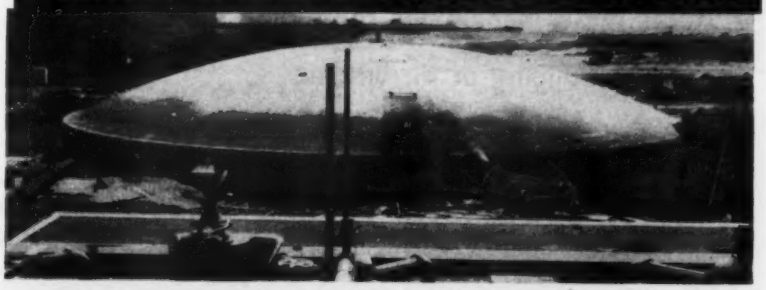

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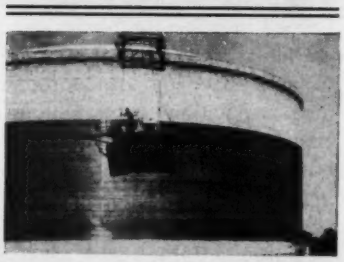

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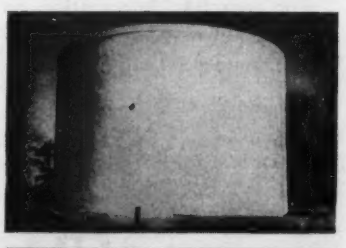

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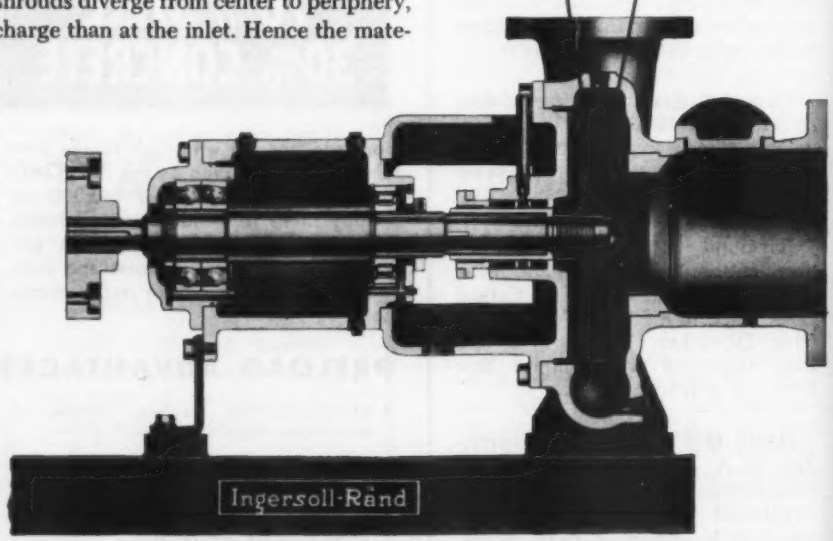
For complete information on this radically new I-R Centrifugal Pump, send for Bulletin 7325-A.



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FOREIGN ABSTRACTS

Degradation of cellulose under heat

The author reviews the literature on the behavior of cellulose at higher temperatures, and discusses possible methods for increasing thermal stability.

In his own experiments, the author has followed changes in strength of rayon, and cotton fibers as a function of the temperature. Measurable degradation was noted even at 100° C. The resistance to tear, copper viscosity, and swelling values all decreased, and copper numbers increased.

Data are given showing the time required on heating, in which the strength decreased to one half of the original values. Thermal durability tests resulted in a wide scattering of results that overshadowed the effects of air versus nitrogen. The lowest ignition temperature of cellulose was found to be about 290° C.

Forty eight references, 9 tables and 9 figures are included. Heinrich Demus. *Faserforsch. u. Textiltech* 7, No. 8, 357-65 (1956) (in German with English and Russian summaries) (through *Bull Inst. Paper Chem.* 27, 191 (1956).

Scutching seed flax straw used in papermaking

Retted and unretted seed flax straw was subjected to shive removal by means of a scutcher (or swingling machine) and the resulting fibers were studied with regard to their papermaking properties.

Experiments were carried out on a semi-commercial scale. Flax tow with about 20 per cent shives was obtained when three passes had been made through the scutcher; the shive content was much lower for unretted than for retted straw. Furthermore, the tow yields were 14-15 per cent for unretted and less than 10 per cent for retted straw, and the fiber quality was better for the former than for the latter. These results coupled with lower cost of processing show that unretted seed flax straw may be advantageous in papermaking operations, when a suitable scutcher is used.

Antoni Nowak and Aleksander Gizycki. *Prace Instytutu Cellulozowo-Papierniczego* 4, No. 2 (7) 34-8 (1955) (original in Polish, with Russian and English summaries) (through *Bull. Inst. Paper Chem.* 27, 202 (1956).

Reactivity of cellulose

The effects of beating, dry milling, acid treatment, drying and swelling of eucalypts alpha pulp on the rate of acetylation were investigated. The rheological properties of papers made from treated fibers were related to their chemical activity. However, paper strength appears to be governed only by the external fiber surface. The reactivity towards acetylation is governed both by the external and the internal surfaces and by the accessibility of the interior of the fibers to the acylating reagent.

After acid treatment for long time periods with 18 per cent hydrochloric acid, or for short periods with 80 per cent sulfuric acid, the reactivity dropped significantly. Wiley (dry) milling of fibers caused a sharp decrease in reactivity with a partial regain of this property when the fibers were subsequently soaked in water and then air-dried. Long drying of the fibers at 105° C. caused a great drop in reactivity with a partial regain when the material was kept at 65 per cent relative humidity.

Beating (in a Valley beater) caused a significant increase in reactivity towards acetic anhydride; a slight increase was also noted when the pulp was hydrated in a Lampén mill. Thus any treatment which might be expected to result in a denser interchain hydrogen bond network, leads to a decrease in the reactivity of the pulp. On the other hand cellulose reactivity is increased by swelling or other treatments that may involve the rupture of hydrogen bonds.

Four tables and 10 references are given. A. W. McKenzie and H. G. Higgins. *Holzforschung 10,* 150-3(1956) (in English).

Location of fatty acid extractives in Finnish woods

Alder, pine, spruce and juniper woods were studied. Thin microtome sections were made and kept in a closed vessel over P_2O_5 in a refrigerator until used. Although both the fatty acids and the resin acids are ether soluble, the former give rise to ether-insoluble bismuth salts that remain fixed in the cells whereas the bismuth salts of the resin acids can be extracted with ether.

The reagent used for fixing the fatty acids was bismuth lactate. The location of these salts in the cell wall was shown by staining them red by means of Sudan III containing phenol and acetic acid, after a thorough extraction of the tissues with ether to remove soluble matter completely.

In the 21 photomicrographs on "negative paper" given by the authors, the light spots against a dark background indicate the positions of the Sudan stained residues. Thus Fig. 1 shows a cross section of juniper wood; Fig. 2, a cross section of pine; Fig. 3, a cross section of spruce and Fig. 4 that of alder.

In the latter the bismuth salts were located mainly in the medullary rays, but also in the middle lamellae of other cells,

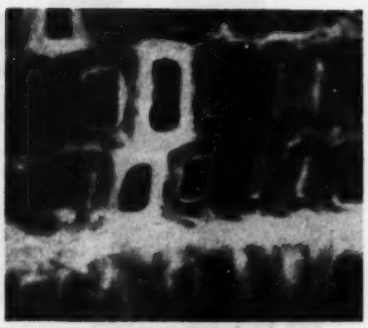

Fig. 1

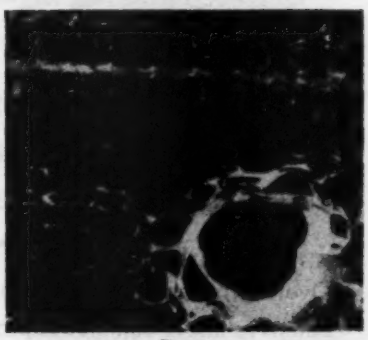

Fig. 2

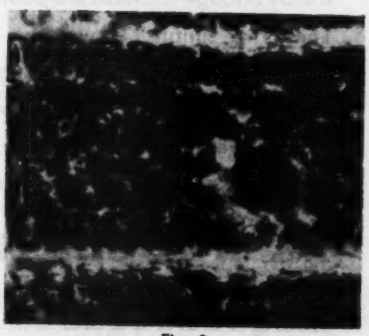

Fig. 3

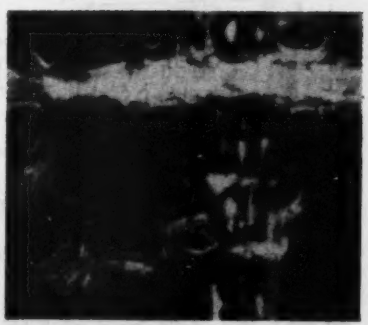

Fig. 4

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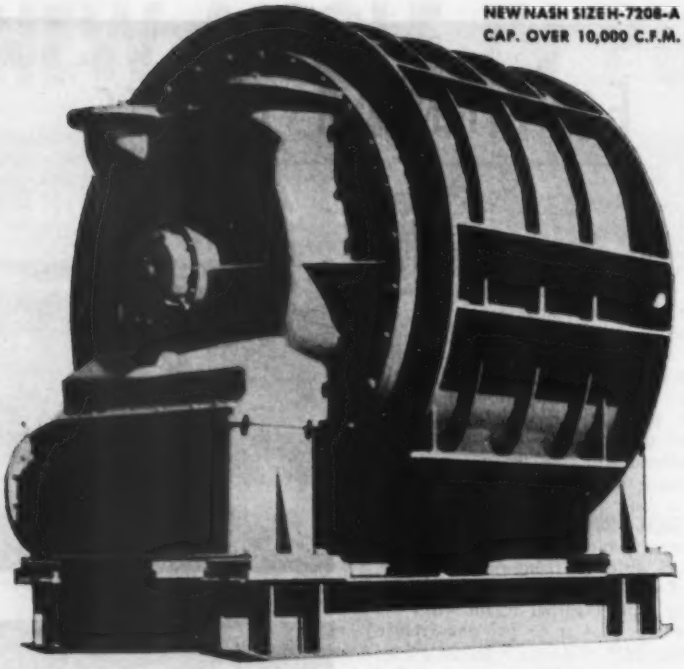

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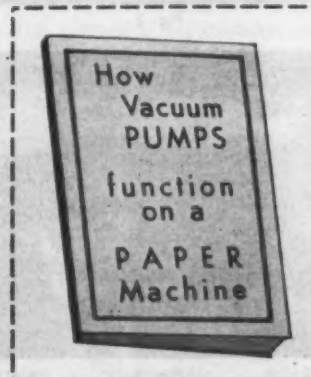

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Foreign Abstracts . . .

and on the walls of vessels. In pine, the insoluble bismuth salts are located largely in the cells of the resin canals, but also in the medullary rays and in the middle lamellae of the tracheids. Spruce presents a picture somewhat similar to that of pine. In juniper, the materials are found in the medullary rays but some tracheids (especially those of the summerwood) are strongly stained by Sudan III. Reference is also made to other work of a similar nature, carried out with birch and aspen woods.

Olavi Perilä and Paavo Manner. *Paper and Timber* (*Finland*), **38**, 499-503 (1956) (in English).

Pulping coniferous wood with sulfurous acid

Wood meals treated with aqueous solutions containing 15 per cent sulfur dioxide at 50° for 3 to 120 hrs showed evidence of marked sulfonation. Wood chips reacted more slowly.

On such treatment, carbohydrate material was removed during the first 30 to 40 hrs and thereafter only lignin was dissolved. In a series of experiments extending over 3 to 12 hrs with 15 per cent sulfurous acid at 50°, the residue was heated another 4 hrs with 6.5 per cent aqueous sulfur dioxide at 115°. Thus the greater the extent of lignin sulfonation during the earlier stage, the better was the delignification at the higher temperature.

Chips which were kept in contact with 15 per cent acid at 50° for 18 hrs and then heated with the same liquor at 145° for 1 hr gave a strong pulp. When the initial stage was extended, the pulp was quite bright and easily bleached.

In another pulping experiment, chips (20 x 25 x 3 mm.) were treated with 15 per cent sulfur dioxide for 72 hrs and then heated at 145° for 10 min. giving 60 per cent of a medium grade pulp. When the time at the higher temperature was increased to 15 min. the pulp yield was 49 per cent, and a relatively bright product was obtained. These digestions were carried out in stainless steel autoclaves. When made in glass, the delignification proved much slower, and required 2-3 times as long as in steel.

M. G. Eliaschberg, A. I. Parfenowa, and J. W. Tichomirowa. *Bumazhnaja Promyshlennost* (*Paper Ind. U.S.S.R.*) **30**, No. 10, 5-7 (1955): through *Holzforschung* **10**, 158-9 (1956) (original in Russian; abstract in German).

The effect of humates on pulp properties

Commercial humates, originally termed "nut stain" — and known commercially as Sap Brown, have a marked effect on the color and strength of the pulp into which they have been incorporated.

Laboratory studies at the Cellulose Institute of the College of Technology at Darm-

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stadt, showed that most strength properties increased when Sap Brown was added. The optimum conditions were reached when about 8 per cent of the humate was added prior to the beating operation, and 6 per cent papermakers alum was incorporated after beating; the latter serving as precipitant.

Higher concentrations led to decreases in strength properties, despite the fact that for a specific time period the "apparent degree of beating" increased. The increases in strength were more apparent in the case of bleached sulfite than with unbleached kraft pulps. When modified lignins (like Tornesch or Torras lignins) were used, strength increases were less marked than with Sap Brown. In place of the alum, ferrous sulfate could be used as preciptant, and this intensified the color of the pulp sheet. Sulfuric acid could replace a part of the precipitant without imparing the strength properties of the pulp.

Color intensities of the pulps improved with increasing amounts of Sap Brown and alum, as well as with prolonged beating; an optimum in color intensity was achieved when both the humate and the alum were added prior to the beating operation. The greatest color intensity was reached when the pH of the mixtures were within the pH range of about 3.5-5.0. Rosin (about 0.8 per cent additions) helped in deepening the shades obtained with Sap Brown.

Methods for determining sorbed humates are discussed. Repeated use of white water also helped in deepening the shade of the sheet. Sap Brown recoveries normally were of the order of 65-70 per cent when white water was reused. For the most complete and the most rapid flocculation of Sap Brown, alum corresponding to 75-100 per cent of the weight of the humate added was required. The degree to which different pulp samples were colored by the Sap Brown varied, depending on the retention of the humate, which itself was dependent on the chemical and morphological properties of the pulps. The rate of sedimentation of the humates was increased by the addition of small amounts of rosin size or tannin. Casein, ammonium chloride and sodium chloride had similar effects but only within certain concentration ranges. Although Sap Brown has lower coloring properties than have certain synthetic dyes, the latter are economically outranked by the former, which is much cheaper.

Fourteen tables, 18 graphs, and 13 references are given. Georg Jayme and Erwin Hechler. *Wochbl. Papierfabrik.* 84, 427-38 (1956) (in German).

High yields in sulfite pulping

In these digestions, the cooking liquors were prepared by adding varying amounts of sulfur dioxide to neutral sodium sulfite solutions.

In a series of cooks, the combined sulfur dioxide was kept constant at 7.6 per cent, calculated on the basis of the wood used. The free sulfur dioxide varied from 2 to 6 per cent, calculated on the same basis. Sprucewood was used and the digestions were carried out at 170°. The pH of the liquors at 20° (following the cooks) ranged from 3 to 7. In this way the liquors contained a buffered system of sulfite-bisulfite.

The resulting pulps are termed "high yield sulfite pulps" (HYS). The sprucewood was also cooked by the usual neutral sulfite semichemical process (NSSC), in which the initial pH of the liquors ranged from 10.4 to 9.2, and the final pH of the spent liquors was 7.1 to 7.9. The two types of cook gave very different pulps. In the case of the NSSC digestions, defibration with a propeller-disintegrator was only obtained when the cook was carried out over a relatively long time period. In the case of a well disintegrated fiber, the pulp yield was 62.2 per cent.

In the newer HYS cooks, the initial pH range from 5.9 to 6.7 and a final range of 3 to 6.3, pulps were obtained. The pulps usually could be disintegrated more easily than those obtained in the NSSC digestions; and the yields ranged from 54 to 67.3 per cent, and sometimes higher. However when the yields were quite high, the fiberizing process left some of the chip cores undigested. The HYS pulps resembled in character the usual sulfite pulps rather than those prepared by the NSSC process.

As indicated in Fig. 5, there is a correlation between the sulfur dioxide consumed and the pulp yields in the high sulfite digestions. Satisfactory cooking conditions for HYS pulps made from spruce entailed a liquor containing 6-8 per cent combined

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sulfur dioxide and 4.5 per cent free sulfur dioxide and a digestion period of 4-5 hrs. at 170°. Pinewood could also be cooked by the HYS process, giving a screened

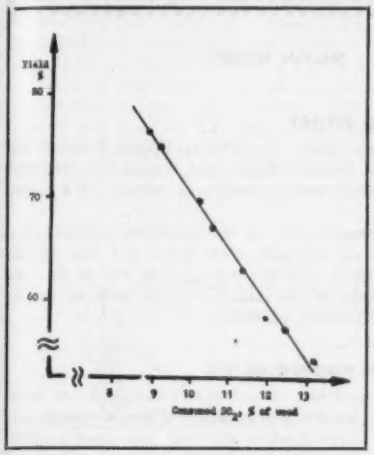


Fig. 5

yield of 62.4 per cent. The HYS pulps were pale in color and showed satisfactory papermaking properties. Tensile strength, tear and folding endurance were equal to those of ordinary strong commercial sulfite pulps and in one case exceeded these.

Three tables, two graphs, and four references are included. A. Bolviken and H. W. Giertz. *Norsk Skogind* 10, No. 10 344-348 (1956) (in Swedish, with English summary).

Fiber structures

Fiber structures other than those of wood with brief descriptions are given of: jute, flax, hemp, banana hemp, ramie and cotton, with line drawings and fiber dimensions.

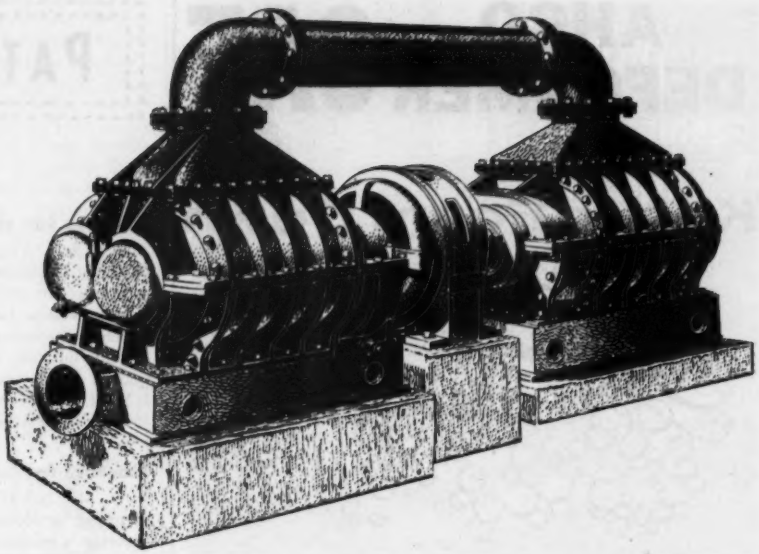
P. R. Deshpande. *Indian Pulp and Paper* (Anniversary No.) 11, 51-4 (1956).

Pulp manufacturing possibilities in the Belgian Congo

The possible establishment of a kraft mill in the Belgian Congo for producing unbleached and bleached pulps is being investigated by the Celluco Syndicate made up of Belgian financiers, colonial officers, and pulp mills.

The research program already instituted has shown, in preliminary runs, that a 47 per cent yield of unbleached kraft pulp can be obtained from the available wood species. Some of the usual schedules would have to be changed; *e.g.* the beating operation presumably would be extended. The pulp produced to date is bleachable and shows tensile strength, burst, tear, and ply-adhesive values that range between 83-90 per cent of those shown by the usual sulfate pulps. The study is being continued.

P. Ceuterick. *World's Paper Trade Review* 146, No 1, 20 and 22 (1956); through *Bull. Inst. Paper Chem.* 27, 219 (1956).



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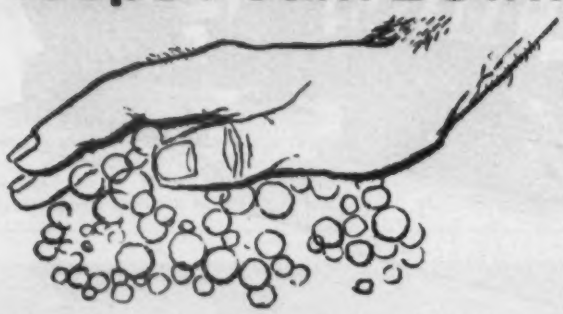

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PATENT REVIEWS

MELVIN NORD*

Process for sizing paper

U.S. 2,762,270, issued Sept. 11, 1956, to Gerald I. Klein and William D. Thompson, assigned to Hercules Powder Co., describes a process for sizing paper with an aqueous emulsion of a higher organic ketene dimer.

The principal advantages cited for this emulsion are: (1) it is readily miscible with and dilutable with water and may be employed at any time with a cellulosic paper either wet or dry, and (2) it may be employed in the sizing of paper without the introduction of a solvent recovery problem.

Doctors for use in papermaking

U. S. 2,767,529, issued Oct. 23, 1956, to Harold E. B. Scott, describes a doctor for use in papermaking. When in use it will develop a number of scraping edges and will also exert a mildly abrasive action on the roll.

The doctor blade is composed of alternate frangible and wear-resisting laminations, the laminations being presented edgewise to the heel of the blade and being impregnated with and bonded together with synthetic resin.

The wear-resisting laminations preferably consist of cloth. The other laminations preferably consist of spun or drawn glass fibre sheet.

In use, glass fibres break off from their laminations and exert an abrasive action on the roll. As a result, recesses are provided in the heel of the blade, giving it a corrugated surface and providing it with scraping edges at the leading edges of each of the wear-resistant laminations. The recesses tend to retain the broken away abrasive fibres, thus enabling them to exert an effective polishing action on the roll, and the formation of a number of scraping edges improves the ability of the blade to remove particles of impurities from the roll.

High dry-strength paper

U. S. 2,765,288, by Arthur D. Jordan, Jr., and U. S. 2,765,229, by Paul J. McLaughlin, each deal with methods of producing paper or felt containing a resin, and having a high dry burst, tear, and tensile strength. The patents were issued Oct. 2, 1956, and assigned to Rohm & Haas Co.

It has been found that the introduction of 0.5 to 2.0 per cent of water-soluble condensation products of lower alkylene oxides with a polymer of monoethylenically unsaturated monomer molecules containing carboxyl groups are highly effective in improving the dry strength of a paper or felt, when they are anchored to the fibres by a polycationic high molecular weight organic flocculating agent previously adsorbed on the fibres.

Process of sizing paper

U.S. 2,764,483, issued Sept. 25, 1956, to Denis J. O'Flynn and William H. Seymour, assigned to E. I. du Pont de Nemours & Co., describes a process for manufacturing sized paper.

An aqueous dispersion of submicroscopic particles of an ethylene-carbon monoxide interpolymer polyamine carboxylate salt is introduced into the aqueous pulp in the beater stage of paper dispersion is maintained at 5.5 to 8.5. The loading of the paper manufacture. The pH of the aqueous pulp after addition of the with this salt (on a dry basis) is 0.1-0.5. per cent.

Apparatus for recovering fibers from pulp-water

U. S. 2,765,915, issued Oct. 9, 1956, to Ivar L. Nilsson, describes a machine for recovering fibres from pulp-water, such as backwater from papermaking machines.

When fibres are to be recovered from pulp-water by means of a rotary filter drum, most of the finer fibres will pass the wire

*Patent attorney, 17600 Pinehurst, Detroit 21.

gauze until a filtering layer of fibres has been formed. Thus, a certain amount of fibres are lost, and further, the liquid filtered is not sufficiently purified before being discharged to the drain.

This difficulty is avoided in the present invention by introducing a finely divided air flow into the fibre suspension supplied to the drum and conducting it towards the point where the rotary drum jacket is sunk below the liquid level. The finely divided air bubbles will then adhere to a great extent to the coarser fibres or lumps of fibres, which are thereby carried off, to be the first to hit the wire gauze. Thus, a porous filtering layer is immediately formed, and the finer fibres are thus retained. Should the liquid not contain enough coarse fibres, a small amount of a more concentrated suspension may be supplied to the point where the rotary drum jacket is sunk below the liquid level.

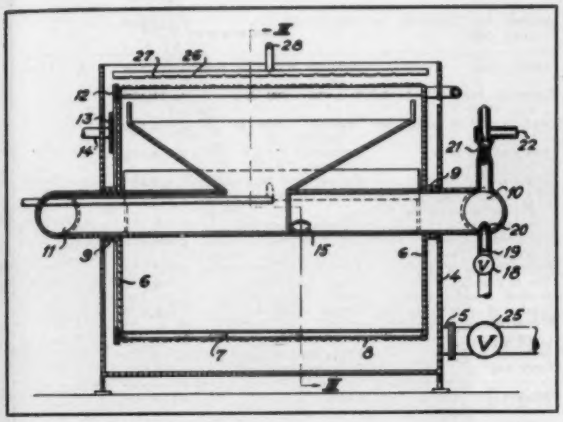


Fig. 1

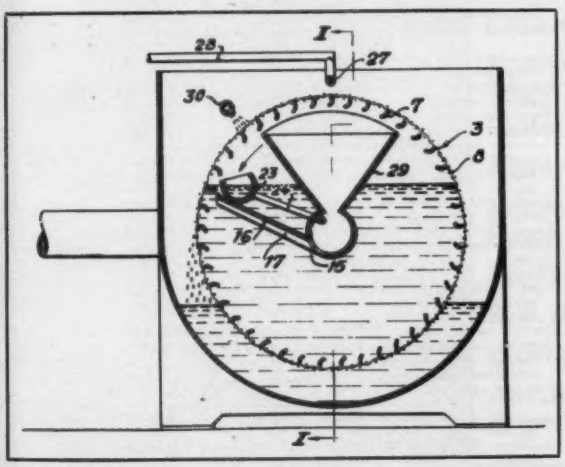


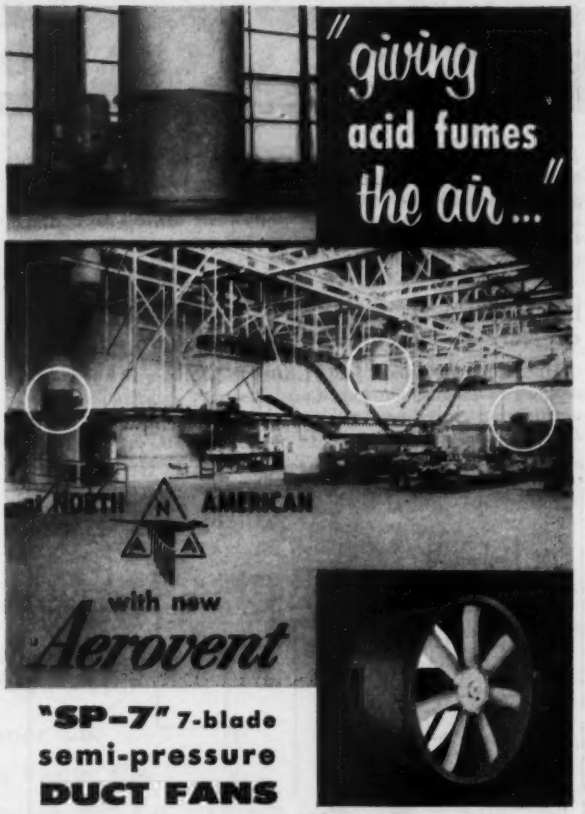
Fig. 2

As shown in Figs. 1 and 2, point 3 is a filter drum mounted in a vessel 4, provided with an outlet 5 near the bottom. The filter drum consists of two solid, circular end-walls 6 joined by means of bars 7 which support the wire gauze 8 forming the drum jacket.

The pulp-water inlet tube 10 has an outlet 15 which is located at the middle of the drum and is directed obliquely downwards at the side of the tube which is turned towards the part of the drum surface which is moving downward. A screen 16 extends along the inner length of the drum and is supported by brackets 17.

A conduit 19 leading from a source of compressed air is connected to a spray nozzle 20 inserted in tube 10 outside the container. Alternatively, a jet pump 21 may be used to supply finely divided air to the suspension of fibres. A trough 23 for supplying additional liquid containing coarse fibres (if needed) is mounted above the screen 16.

The air bubbles introduced into the liquid will adhere to the coarse fibres and lumps of fibres which thereby rise upwards when



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flowing through the opening 13, and follow the underside of the screen 16 towards the periphery of the drum, settling on the wire gauze in the form of a porous layer.

The filtered liquid flowing off through the wire gauze is collected in the surrounding vessel 4 and is removed through the outlet 5.

Incorporation of quarternary ammonium compounds into paper

U. S. 2,756,647, issued July 31, 1956 to Lawrence P. Thompson, assigned to Personal Products Corp., describes a method of incorporating quaternary ammonium compounds into soft paper tissue, for bactericidal and deodorizing effects.

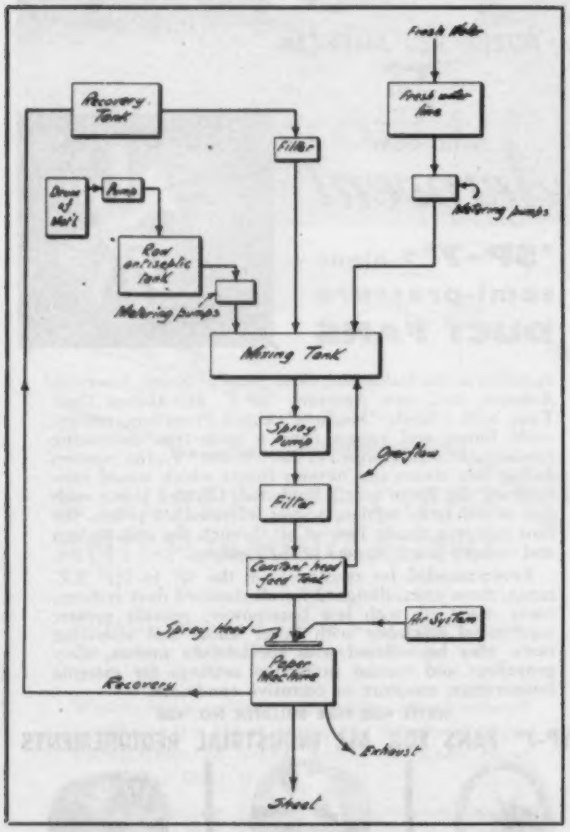

Fig. 3

As shown in Fig. 3, the material (a quarternary ammonium compound) passes through a pump into the tank of raw antiseptic and is distributed in a mixing tank which combines it with the correct proportion of water by means of metering pumps. The percentage of quaternary ammonium compound in the solution in the mixing tank is 0.5-10.0 per cent by weight.

The aqueous solution passes through a spray pump into a filter for removal of any impurities. The solution then goes to a constant head feed tank, and then to the spray head where it is mixed with air in an atomizing process. The spray head applies the atomized solution against the partially dried formed tissue. Material that is not absorbed by the paper tissue is caught within the catch pan or flows over the side of the hood and is recovered into a recovery tank from which it returns through a filter from which it returns through a filter into the mixing tank.

The spray head directs the atomized spray upward against the paper while it is on a large drum drier, and still moist.

Other Patents of Interest to the Pulp and Paper Industry

Subject	Inventor or Assignee	Patent No.	Date
Paperboard carton with sift-proof opening device and reclosure	Robert Gair Co. Inc.	2,757,850	8/7/56
Containers	George Arlington Moore	2,757,851	"
End wall construction for file drawers	Convoy Inc.	2,757,852	"
Stacking paperboard container	Container Corp. of America	2,757,853	"
Tube for packaging doors	Howard M. Wall	2,757,854	"
Bag closure	Bemis Bro. Bag Co.	2,757,855	"
Sized waterlaid glass fiber products	American Cyanamid Co.	2,758,026	"
Flexible corrugated wrapping shell	Alfred Dowd	2,758,047	"
Method for stretching fibrous mats	Aldo Ceretti	2,758,048	"
Jordan plug	John W. Bolton & Sons Inc.	2,758,516	8/ 14/56
Shopping bag with turned over edges	Interstate Bag Co.	2,758,519	"
Manufacture of lined cartons	Imperial Chemical Industries Ltd.	2,758,520	"
Partition collapser	Corrugated Paper Machinery Co. Inc.	2,758,521	"
Shipping box	General Box Distributors	2,758,739	"
Partitioned traction grit dispensing container	Crown Zellerbach Corp.	2,758,773	"
Package	Marathon Corp.	2,758,774	"
Container structure with integral closures	George Arlington Moore	2,758,775	"
Palletized containers	Elmer G. Ellstrom et al	2,758,776	"
Box or case	Albert Lee Dixon	2,758,777	"
Window display carton	Morris Paper Mills	2,758,778	"
Reinforced paperboard box construction	Morris Paper Mills	2,758,779	"
Lined carton	Joseph F. Imbs	2,758,780	"
Container	The Lawrence Paper Co.	2,758,781	"
Carry bag	Wolf Brothers Inc.	2,758,782	"
Machine for making triple wall corrugated paperboard	Corro Ltd.	2,759,523	8/21/56
Pleated paper filter element	William S. James	2,759,610	"
Container carrier	Federal Paper Board Co.	2,759,629	"
Container for fragile articles	Keyes Fibre Co.	2,759,650	"
Corrugated container	Charles Dowd Box Co. Inc.	2,759,651	"
One gang multiple lift partition box unit	Frank H. Burgess	2,759,652	"
Insulated carton	Bloomer Bros. Co.	2,759,653	"
Cushioned cartons	Sutherland Paper Co.	2,759,654	"
Knock-down display box	Milton Levy	2,759,655	"
Package having tear strip	Erving Paper Mills	2,759,657	"
Apparatus for reducing edge flash in pulp molded articles	Keyes Fibre Co.	2,760,412	8/28/56
Covered bottle carrier unit	Morris Paper Mills	2,760,672	"
Collapsible tapered carton	Marathon Corp.	2,760,709	"
Carton locking device	Marathon Corp.	2,760,710	"
Folding paperboard carton	Robert Gair Co. Inc.	2,760,711	"
Carton	Marathon Corp.	2,760,712	"
Carton	Marathon Corp.	2,760,713	"
Light shield and reinforcement structure for beverage cases	The Jackson Box Co.	2,760,715	"
Carrying carton	Pabst Brewing Co.	2,760,716	"
Digestion of lignocellulose material with halogen-substituted saturated aliphatic aldehydes	Shell Development Co.	2,760,861	"
Stock inlet for papermaking machines	Nicholas J. Niks	2,764,917	10/2/56
Apparatus for folding box blanks	International Paper Box Machine Co.	2,764,918	"
Log debarker utilizing rubbing action of rubber-tired wheels	Jesse A. Jackson	2,765,011	"
Oscillatable bark-removing jet continuously directed toward axis of a passing log	Sumner Iron Works Inc.	2,765,012	"
Rotary suction drum filter	The Black-Clawson Co.	2,765,085-6	"
Bottle carriers	Coates Board & Carton Inc.	2,765,100	"
Hollow-walled boxes	Marshall I. Williamson	2,765,113	"
Hydraulic log barker	Sumner Iron Works Inc.	2,765,198	"
Production of transparentized paper	Rohm & Haas Co.	2,765,243	"
Box blank folding machine	Post Machinery Co.	2,765,714	10/ 9/56
Matrix for creasing paperboard for cartons	Nils Andersson	2,765,716	"
Cartons containing easels	Continental Folding Paper Box Co. Inc.	2,765,906	"
Machine for handling multilayer paper bag packages	Edwin C. Kraus and Maurice V. Douthitt	2,765,931	"
Partitioned box or container	E. J. Brach & Sons	2,765,971	"
Paperboard cartons	Rolf A. Samsing	2,765,972	"
Mailing or shipping carton	Reuben M. Goldstein	2,765,973	"
Bag closure	Marathon Corp.	2,765,974	"
High wet-strength paper	Johnson & Johnson	2,766,137	"

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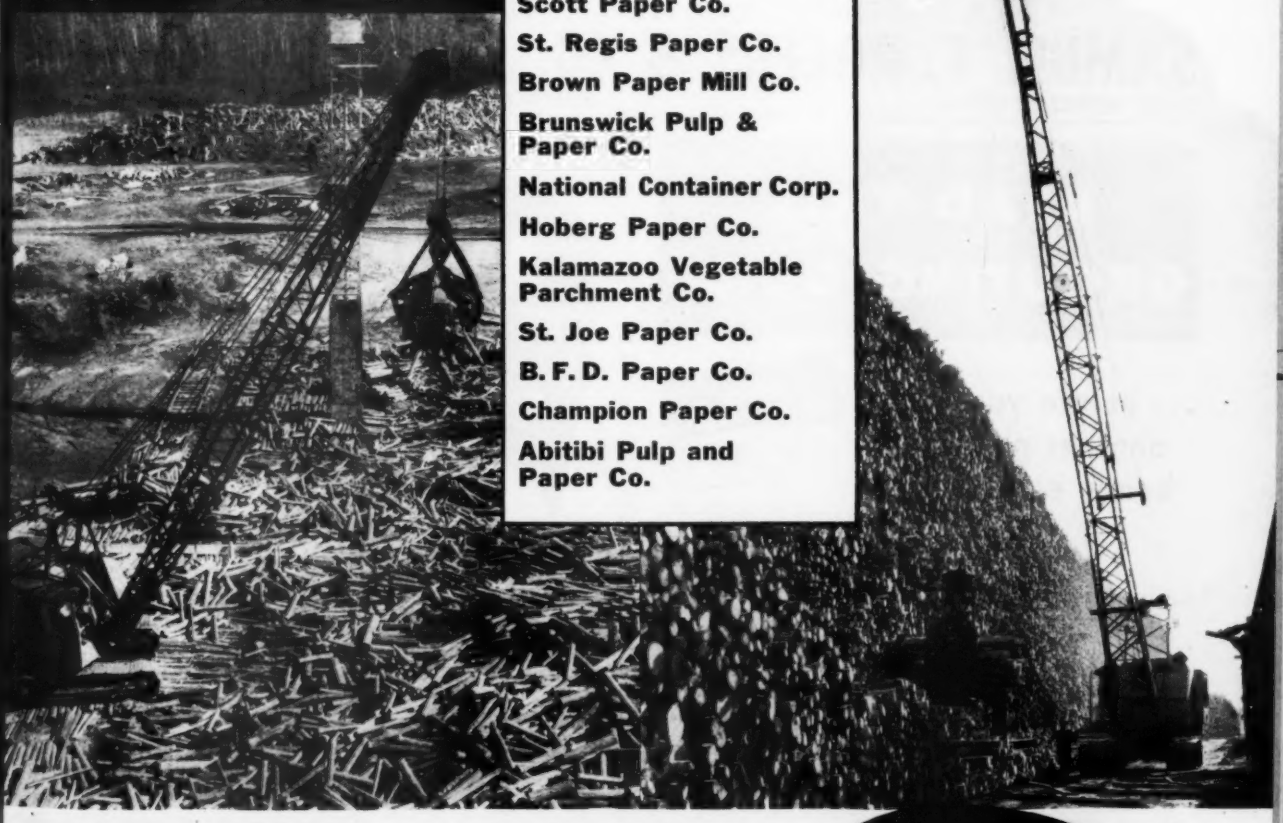
- **National Container Corp.**
- **Hoberg Paper Co.**
- **Kalamazoo Vegetable Parchment Co.**
- **St. Joe Paper Co.**
- **B. F. D. Paper Co.**
- **Champion Paper Co.**
- **Abitibi Pulp and Paper Co.**



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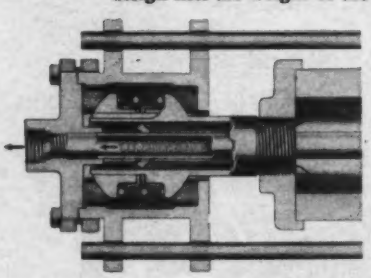

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845 Wood St., Three Rivers, Mich.

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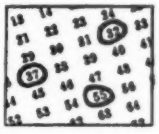

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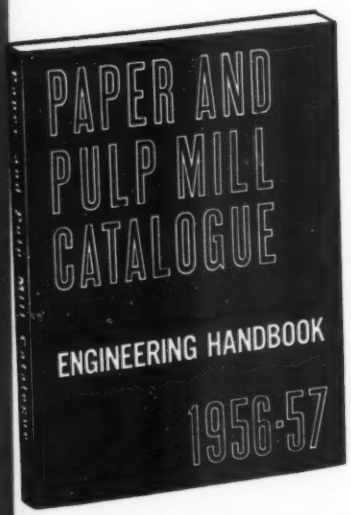

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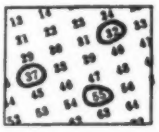

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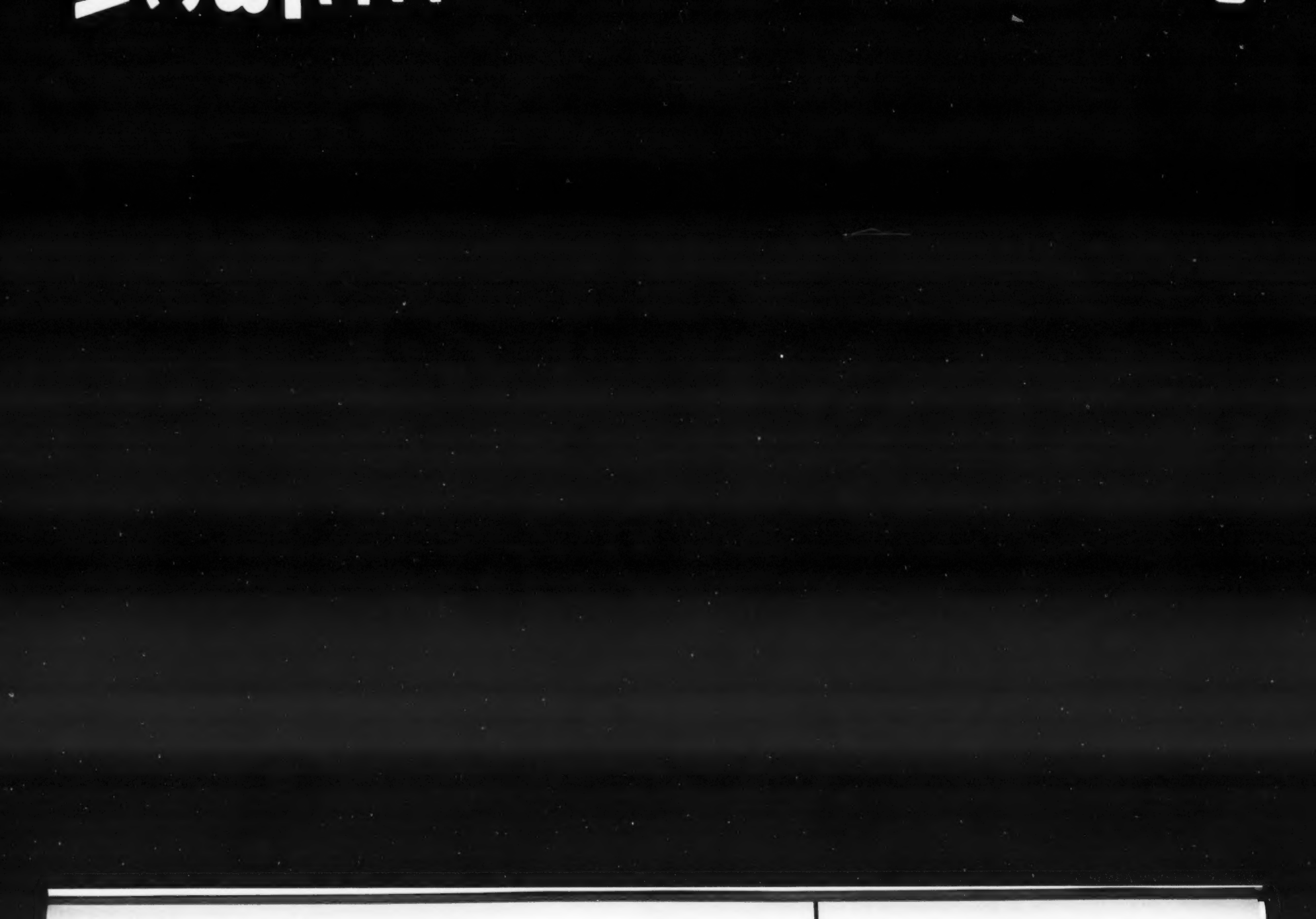

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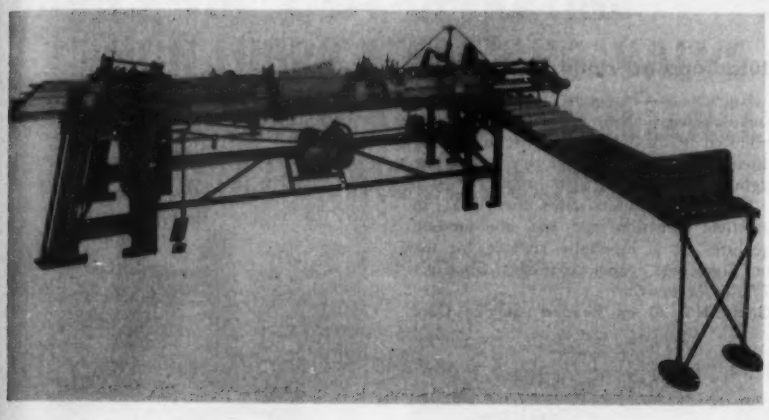

Paper banding machine

A new banding machine, Model No. 3, is designed to provide automatic banding of paper and paper products measuring up to 18 in. in unbanded direction, 12 in. in the banded direction, and up to 1½ in. depth or thickness.

Model No. 3 will efficiently handle paper or paper products as small as 12 in. in either direction and up to 2 in. deep. *W. O. Hickok Manufacturing Co.*

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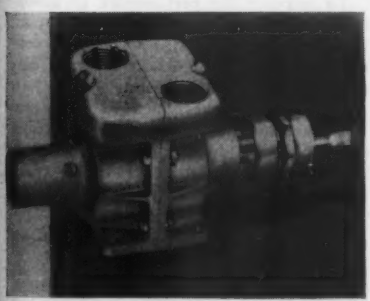

Rotary pump

Designed specifically for the purpose of injecting hydrazine in make-up water for boiler feed treatment, this pump is available in all conventional types of mountings and with electric motor, air motor, pulley and chain drives.

The pump is made of 304 stainless steel. *Eco Engineering Co.*

Circle No. 12 on Readers' Service Card

Tension control system

This system used for winding and unwinding operations employs an accurate new method of control.

The tension control is applicable with any air-actuated clutch or brake. It measures and controls tension directly within a transmitter rather than through a remote mechanism. This is all accomplished by passing the web of material over a load sensing roll which is supported on one end by a journal mounted on the sensing transmitter.

The old hunting method of measuring and control are eliminated since this equipment requires control in one direction only. *Pneumatic Applications Co.*

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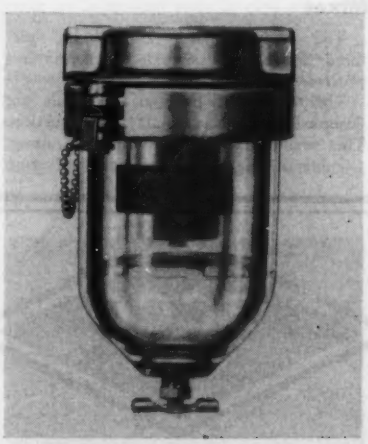

Compressed air filters

Many advancements in air filtration has been incorporated in the completely redesigned compressed air filter pictured above.

The company states that the series 30AE filters offer improved operating efficiency, reduced maintenance costs and will increase life of air operated equipment.

The new filters are designed to give better liquid removal, less pressure drop, and a choice of filter elements. *Norgren Co.*

Circle No. 14 on Readers' Service Card

Remoistening gum

This remoistening gum is an all-vegetable adhesive gumming. The process used in the making of this gum, eliminates the undesirable odor and taste which is characteristic in animal glue.

A long tack range is provided after remoistening, so that short delays in adhering remoistened surfaces are permissible. *National Starch Products Inc.*

Circle No. 15 on Readers' Service Card

Transient converter

Fischer & Porter has developed a transient converter for use with turbine-type flowmeters. This converter accepts a sinussoidal-type input signal of varying frequency and provides either an analog output for recorders and oscillographs or a digital output to counters and computers.

Descriptive literature on these units is available from the company. *Fischer & Porter Co.*

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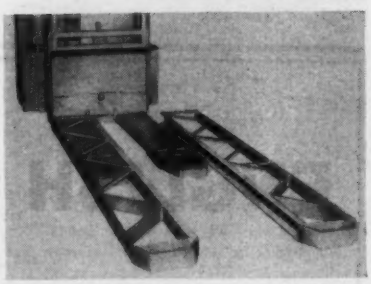


Fork extensions

The picture above shows the fork of a pallet truck. It shows the assembling of the fork extensions on the fork.

The use of these extension forks enables the pallet truck to handle long, light,

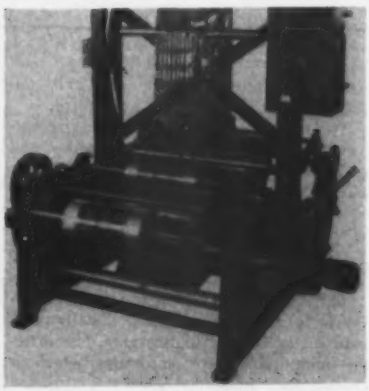
New Products . . .

bulky loads on either skid platforms or open-faced pallets.

Rugged and durable, these extensions are of all-steel construction and can be easily slipped on or off.

A wide range of sizes are manufactured to fit any pallet-type truck. *Lewis-Shepard Products Inc.*

Circle No. 17 on Readers' Service Card



Turret-type winder

Pictured above is a turret-type winder which can be installed at the wind-up end of the Wolverine press.

It is said to automatically maintain uniform tension throughout the winding operation.

Desired tension is set by turning a dial for take-up on any type of stock without stretching or distortion. *Hobbs Manufacturing Co.*

Circle No. 18 on Readers' Service Card

Totally-enclosed a-c motors

A new line of totally-enclosed, air-over a-c motors has just been introduced. These motors produce varying horsepower according to the application of varying air velocities. The effect is accomplished by the cooling effect of the air flow over the motor frame created by the fan or blower it powers.

The motors are available in the new NEMA frame sizes from ½ through 30 hp and may be operated on 208 volt network systems. *Reliance Electric & Engineering Co.*

Circle No. 19 on Readers' Service Card

Butadiene-acrylonitrile latex

Known as Chemigum Latex 247, this butadiene-acrylonitrile latex has been introduced to give improved resistance to discoloration upon exposure to heat or light.

The manufacturer states that it is an excellent adhesion and has fiber-binding qualities. It is especially suitable for use in pigmented paper coatings. *Goodyear Tire & Rubber Co.*

Circle No. 20 on Readers' Service Card

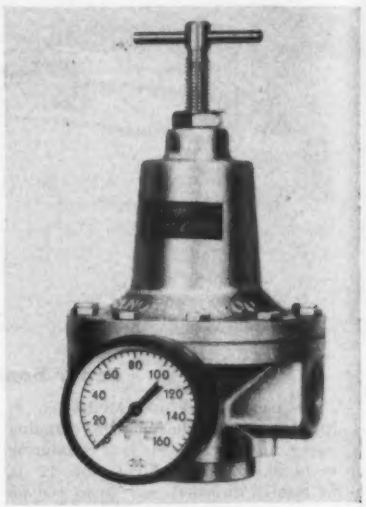
Mixer

The "impact-in-air" comminutor pictured above, is designed for continuous processes where needed.

The functional parts of the unit are designed for "snap-apart" construction. This permits rapid and thorough cleaning.

Some of its uses include: the reduction of paper stock slurries with simple and very low horsepower units; de-asphalting paper furnishes slurries at normal temperatures and pressures; carry out sulfonation on a continuous basis; preparation of paper coatings on a continuous basis; and even handles the seemingly impossible mixtures having dilatant properties. *Cog Corp.*

Circle No. 21 on Readers' Service Card



Pressure regulators

To improve the performance of air-operated equipment, new and important advancements in compressed air pressure control have been designed in the new line of Norgren pressure regulators.

Larger air passages, balanced valve construction, improved siphon tube action, greater effective diaphragm area, and hand-removable bottom plug for easier maintenance are among the new features found in these new units. *Norgren Co.*

Circle No. 22 on Readers' Service Card

Adhesives

Three adhesives have just been developed for combining vinyl chloride films.

Resyn emulsion 33-8020 is a general

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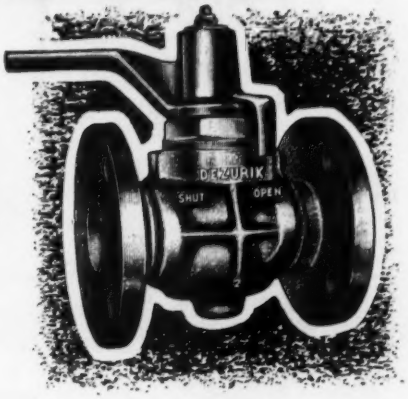

Basis Weight Control, Stock Chest Level Control, Automatic Knock-down Shower Valve, Liquid Alum Distribution System, Liquid Size Distribution System, White Water Chest Level Control, Clay and Stock Slurries, Throttling Stock of Jordans or Refiners, Manual and Remote Pulper Dump Valves, 3-Way and 4-Way Valves for Multiple Jordan Hook-up, Beater or Slush-Maker Makeup Water, Compressed Air and Many, Many Other Services.

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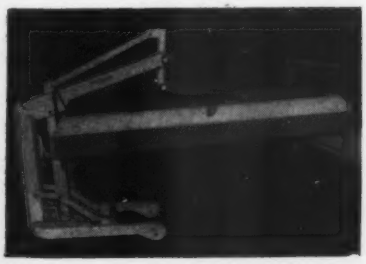
purpose emulsion for adhering vinyl film to cloth, paper and paperboard.

Resyn emulsion 33-8010 has similar properties but it is preferred for knife coating.

Resyn emulsion 33-8030 is preferred for the wet combining of vinyl chloride to paperboard and wood. *National Starch Products Inc.*

Circle No. 23 on Readers' Service Card



Fork truck

A completely new type of fork truck has been designed and is capable of a tremendous range of lifting, loading and hauling work.

With this new truck, called the "Hydrauliphant", ground floor loading and unloading is readily accomplished without loading docks. The crane-type load arm can reach up to a 108-in. lift height with 100 per cent free lift and actually deposit loads well back in truck beds without need of dragging load to tail-gate. This is shown in the picture above. *Autoquip Corp.*

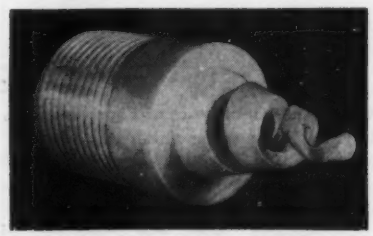
Circle No. 24 on Readers' Service Card

By-pass rotameter

The new Brooks by-pass rotameter is designed to permit economical measurement of large fluid rates in pipe sizes of 2 in. and more.

Some of the features in this unit are: linear response; wide range (up to 10 to 1), direct reading scale; and ability to handle corrosive fluids. *Brooks Rotameter Co.*

Circle No. 25 on Readers' Service Card



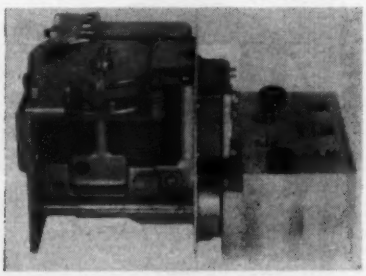
Nozzles for cone spraying

Spiral nozzles of Teflon have been designed to make possible a full cone spray pattern. A wide angle of 120° and a narrow angle of 90° is available in this new design.

The series includes nozzles with orifices from ⅛ in. in diameter to ½ in. in diameter with flow rates from 2 to 70 GPM.

The picture above shows the new design of this type spray. *Bete Fog Nozzle Inc.*

Circle No. 26 on Readers' Service Card



Pneumatic computing relay

Pictured above is a pneumatic computing relay called the Model 56-1. This model can be adjusted to perform any one of six different arithmetic functions.

Measurements are received by the relay as pneumatic signals (3-15 psi); computer output to a recorder or controller is also in terms of 3-15 psi.

Some of the units applications are: fuel-air flow rationing, boiler swell com-

New Products . . .

pensation, and flow totalizing on multiple lines. Virtually any arithmetical operation, such as addition, subtraction, multiplication and division, can be accomplished. *The Foxboro Co.*

Circle No. 27 on Readers' Service Card

Polyvinyl acetate emulsion

Elvacet 84-1100 is the trademark for a new polyvinyl acetate emulsion which has just been developed. This emulsion is known to have excellent water resistance.

Uses of this chemical include adhesives and paper coatings. *E. I. du Pont de Nemours & Co. Inc.*

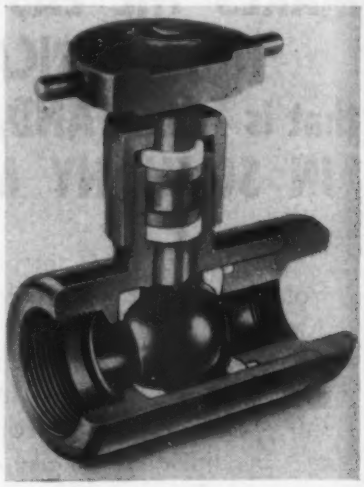
Circle No. 28 on Readers' Service Card

Unplasticized PVC pipe

Easton Co. has a complete line of unplasticized PVC pipe which is available in all standard pipe sizes from ¼ in. to 6 in.

This piping has an increasing number of applications to the industries. It resists corrosion and most chemicals and meets many requirements of the chemical process industries where inertness and purity are paramount. *Easton Plastic Products Co. Inc.*

Circle No. 29 on Readers' Service Card



PVC ball valves

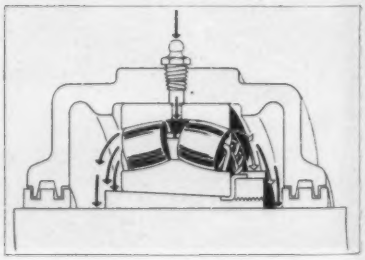
This company is the first to offer an all PVC valve complete with air operator for remote control and sequence operations.

The new valve combines an outstanding design principle with a new material for handling corrosive and other difficult fluids.

Sizes ½ to 2 in. are available at the present, but the company will manufacture 3 and 4 in. sizes in the near future.

Full flow, quarterturn shut-off, with thousands of leaktight cycles and no maintenance are among the outstanding features of these valves. *Jamesbury Corp.*

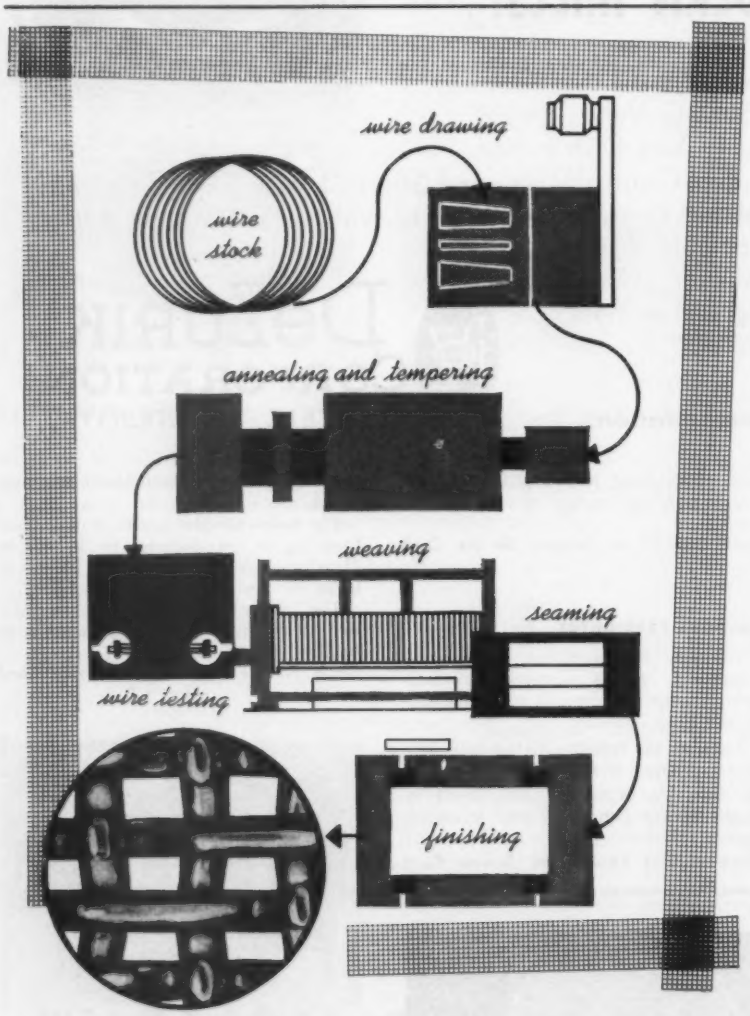
Circle No. 30 on Readers' Service Card



Spherical roller bearings

This latest design improvement on roller bearings, provides a method to obtain the more efficient center instead of side lubrication of the bearing—resulting in a longer bearing life.

This is accomplished by means of a groove machined around the circumference of the bearing outer ring. Equally spaced holes drilled in the ring, channel the lubricant from the groove to the center of the bearing. The lubricant, which is in-



Operation by operation, the manufacture of Fourdrinier wire cloth at Lindsay, has been taken under our strict control. To be directly responsible for quality step by step is to insure a quality finished product. The Lindsay Wire Weaving Company, Cleveland 10, Ohio.

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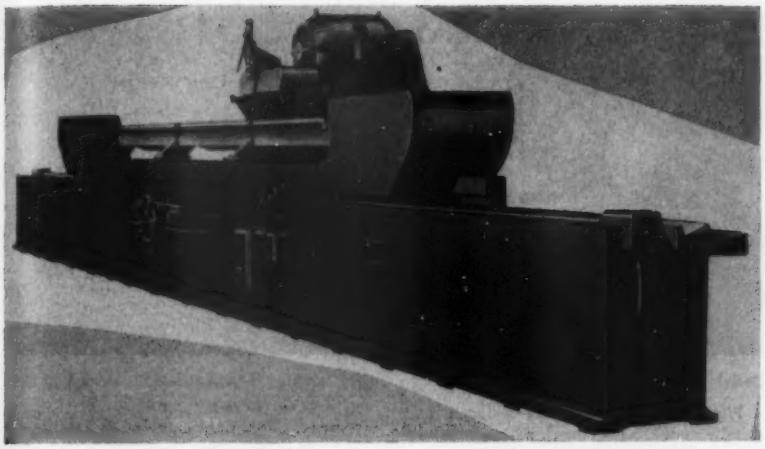


Knife and face grinder

Announcement has been made of a new, heavy-duty knife and face grinder called "Series 220."

This is a high production precision grinder suitable for grinding shear blades, dies and machine knives. It is also equipped as a face grinder with a slotted table for face work up to 24 in. high and 18 in. wide.

The machine is made in 11 different sizes: 78 in., 90 in., 102 in., 110 in., 122 in., 134 in., 144 in., 160 in., 180 in., 200 in. and 220 in.

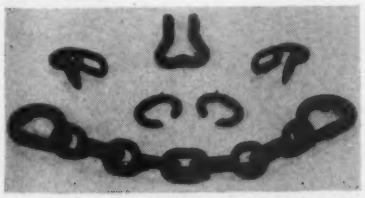
It is equipped with an oversize heavy-duty, totally-enclosed ball bearing wheel head spindle. Also available are three different sizes of segmental grinding wheels: 20 in., 26 in. and 30 in.

It is equipped with hydraulic table drive with table speeds from 10 to 100 ft. per minute or faster on special orders. *Samuel C. Rogers & Co.*

Circle No. 31 on Readers' Service Card

troduced through a fitting in the center of the housing cap, moves along the groove and through the holes directly to the center of the bearing. Thus, all working surfaces are quickly and completely covered with lubricant. *SKF Industries Inc.*

Circle No. 32 on Readers' Service Card



New-type chain system

In this new chain system, a small inventory of "thermopruf" links, connectors, etc., enables a user to make any length of chain required for any immediate condition without cutting and welding.

The company states that the components of the new system provide longer wearing qualities, greater corrosion and heat resistance than any steel-type kiln chain.

The links used in this new system are pictured above. *Allis-Chalmers Manufacturing Co.*

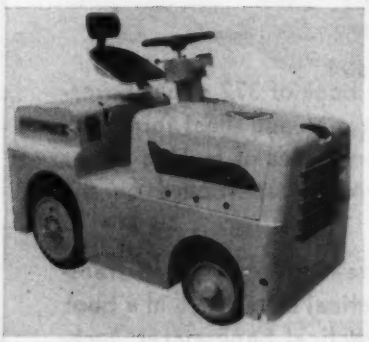
Circle No. 33 on Readers' Service Card

Mixed-bed ionXchanger

This unit, which is fully automatic, processes water to a high degree of purity. Using the mixed-bed principle of ionXchange, the unit provides water that is free of silica and all ionizable solids with purity meter readings of over 1,000,000 ohms per cubic centimeter.

All necessary equipment needed for the unit is included in the shipment. It comes completely pre-assembled and ready for connection to water supply. *Illinois Water Treatment Co.*

Circle No. 34 on Readers' Service Card



Industrial tractor

The model GLT Dynamotive four-wheel tractor has just been designed with a completely new drive principle for industrial-type tractors.

High-torque drive principle used in railroad switch engines has been applied to this tractor. This consists of a high-output generator direct-coupled to a continental gasoline engine. The generator

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New Products . . .

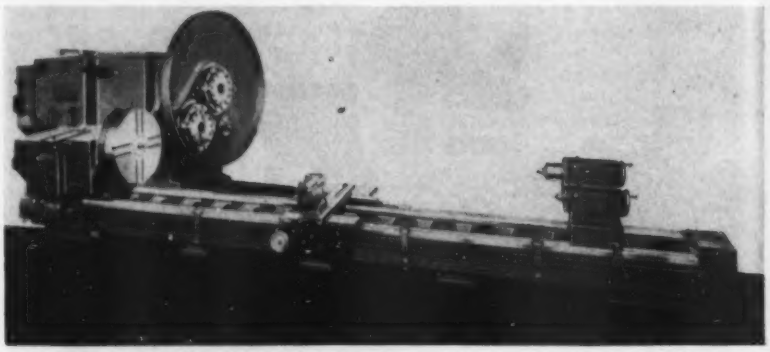
powers a high-torque electric motor which, in turn, is direct-coupled to the differential pinion. This new drive principle results in a fuel saving of over 25 per cent. *Automatic Transportation Co.*
Circle No. 35 on Readers' Service Card

Hot-plate and magnetic-stirrer

Pictured above is a new, combination hot-plate and magnetic-stirrer. This unit is designed to cut hours of routine stirring, mixing and dissolving operations in industrial laboratories and research departments.

The hot-plate and the stirrer can operate independently or simultaneously.

Known as Thermix, it is supplied with glass-covered and also teflon-covered stirring magnet, integral motor, and rubber covered line cord for operation on 115-volt 50-60 cycle ac. *Fisher Scientific Co.*
Circle No. 37 on Readers' Service Card

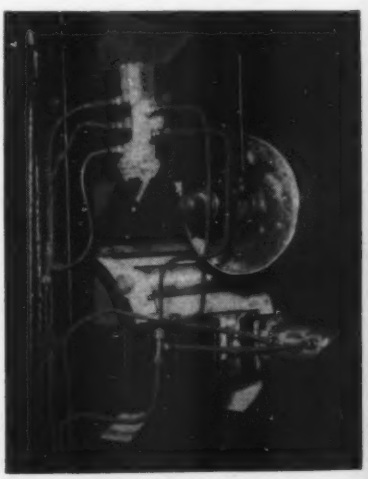


Dual spindle lathe

Pictured above is a newly designed dual spindle lathe. The machine can handle large and small diameter work. The upper spindle of the new lathe provides a swing-over-the-bed of 60 in. and the lower spindle provides a swing of 40 in.

An extreme feature of the machine is its ability to engage and disengage the various drives at will.

Beds for the machine may be had in any required length, and in one piece up to 35 ft. between centers. The lathe is built to support 15 tons between centers. *Boye & Emmes Machine Tool Co.*
Circle No. 36 on Readers' Service Card



Starter and stripper threaders for calender stack

The starter and stripper threaders shown in the installation picture and diagrammatic sketch herein are developed primarily to eliminate the nip hazard and are also a production tool.

The units are constructed of lightweight materials. They are operated by compressed air which is used only when the units are in threading position. After threading, starter and stripper threaders retract automatically and are out of the way of the operator at all times.

In operation, the paper is fed over the top roll through the starter threader safety feed lip (starter threader is used on the top roll only). All threaders then retract automatically after threading. All

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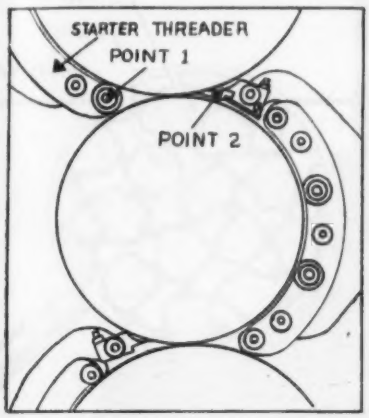
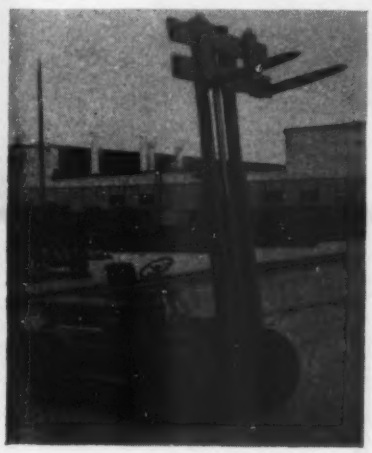
threaders operate on the web-running side of the roll. Calender roll doctors are positioned on the opposite side of the threaders and do not interfere in any way.



The engineer's drawing shows a cross-section view of the calender stack. Point 1 shows where tail of paper leaves guide mechanism of either the starter or stripper threader. Point 2 shows positive positioned doctor. Tail is stripped off upper roll and directed through stripper threader guide mechanism. Threaders are operated from a central four-way control valve. *McAfoos Sales & Engineering Co.*

Circle No. 38 on Readers' Service Card



Outdoor lift truck

Power brakes, power steering and finger-tip directional control are standard on a new 8000-lb. capacity, pneumatic tire fork-lift truck.

With four speeds in each direction, the truck, known as the "Yardlift 8024", will travel 16½ mph forward and 16 mph reverse and climb a 21 per cent grade loaded. *Clark Equipment Co.*

Circle No. 39 on Readers' Service Card

Wastewood chipper

This chipper features a horizontal feed, 53 in. diameter disc, six knives and is available in an overhead or bottom discharge arrangement.

The machine was designed for the smaller operation where initial investment must be kept low but where production and chip quality can not be sacrificed. *Wilco Machine Works.*

Circle No. 40 on Readers' Service Card

A nonionic surface active agent

Alkanol HCS is a new chemical used as a nonionic surface active agent based on an ethylene oxide condensate of a high molecular weight fatty alcohol.

The properties of this chemical suggest its use as a retardant and leveling agent in dyeing process, a detergent, and as an emulsifying and dispersing agent of general utility. *E. I. duPont de Nemours & Co. Inc.*

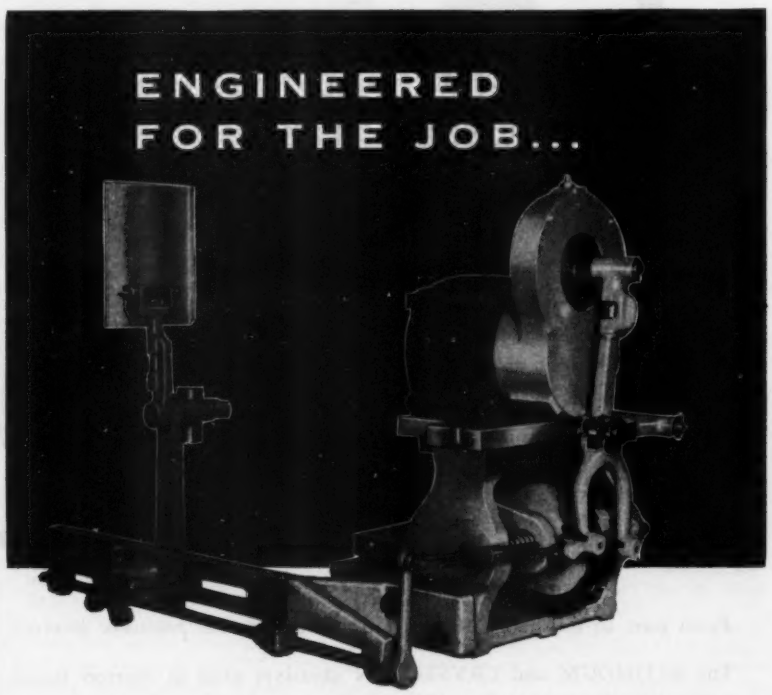
Circle No. 41 on Readers' Service Card

Calculator for use on slitter-rewinder

Tension horsepower and friction horsepower of a slitter-rewinder can be calculated according to the width and speed of the web with this calculator.

The calculator has been devised to also figure web lengths in rolls according to web caliper. *Black-Clawson Co.*

Circle No. 42 on Readers' Service Card



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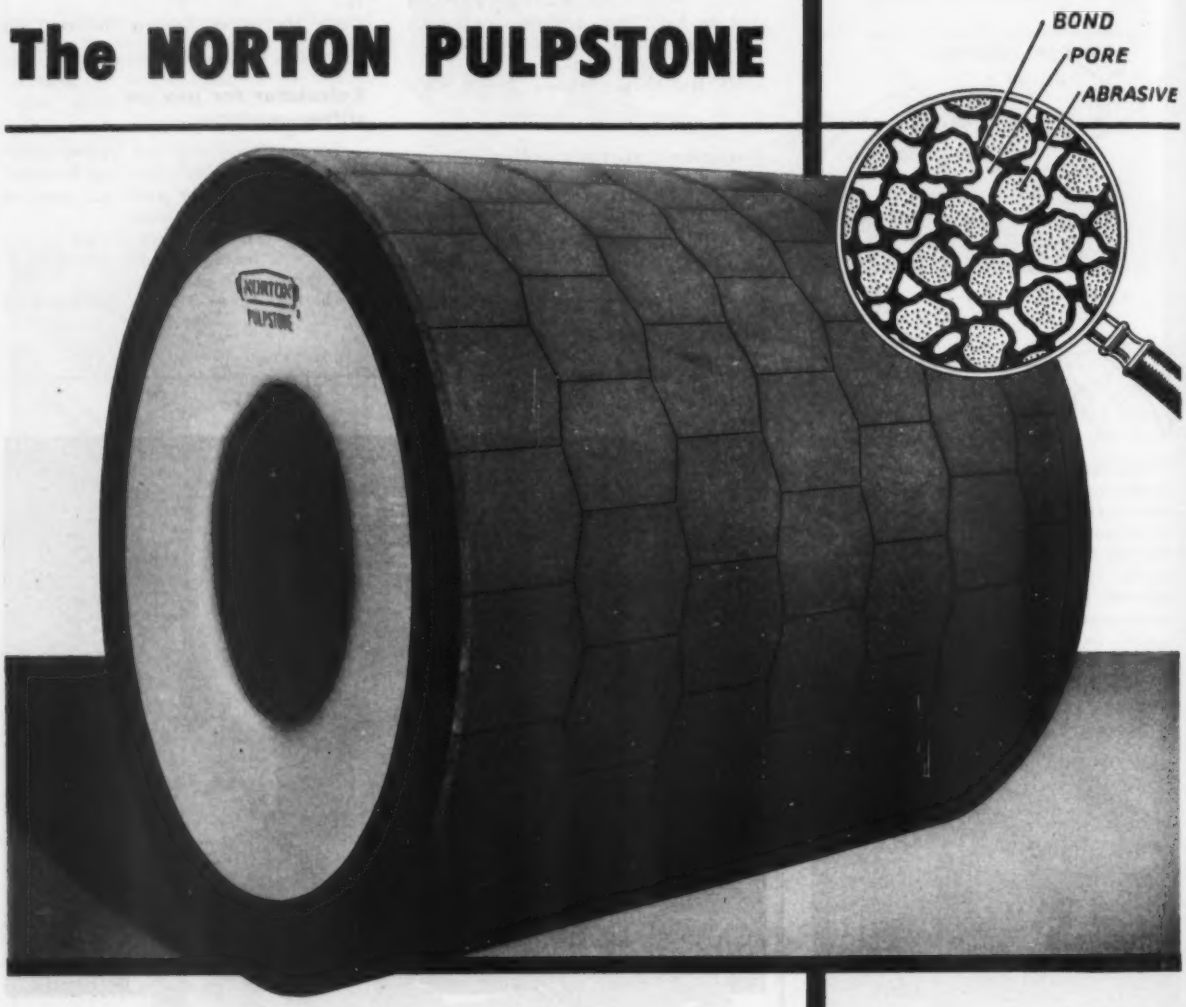

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From the day it starts making pulp until finally worn out you can depend on the Norton Pulpstone to produce thousands of tons of top quality pulp. It is a stone that has been precisely built to *your* specifications to convert *your* type of wood into the type of pulp you want.

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NEW LITERATURE

Books

LEGAL PROBLEMS IN ENGINEERING. By Melvin Nord. Published by John Wiley & Sons Inc. 440 4th St., New York 16, N. Y. 391 pages. $7.50.

Written by an engineer who is also a practicing lawyer, this book is a broad, authoritative survey of those aspects of law which most concern the engineer.

The book does not pretend to make the engineer independent of lawyers, it is written only to give the general background concerning legal problems which arise in the field of engineering.

It is a very useful handbook to any engineer in helping them to work more effectively with lawyers.

WHY D-C? By General Electric. Published by General Electric Co. Erie, Pa. After a recent market research made by the company, GE has found that direct-current has become the trend in industry.

This book covers a few of the many uses in direct-current.

COMPUTERS—THEIR OPERATION AND APPLICATIONS. By Edmund Berkeley and Lawrence Wainwright. Published by Reinhold Publishing Corp. 430 Park Ave., New York 22, N. Y. 366 pages. $8.00.

The newest developments in both the techniques and equipment of automatic computing are described and illustrated in this book.

Some of the features included in this book are: applications of computing machines in scientific laboratories; names and addresses of organizations from whom automatic computing equipment may be bought or rented; a glossary of terms and expressions used in the computing field; and also a listing of books, periodicals, papers and organizations offering further information on all aspects of automatic computing machinery.

Anyone who is concerned with the selecting or usage of computing machines, will find this book very useful.

THE CHEMISTRY OF PETROCHEMICALS. By Melvin J. Astle. Published by Reinhold Publishing Corp. 430 Park Ave., New York 22, N. Y. 267 pages. $6.50.

Anyone wishing to gain a broad background of what has been acomplished in the field of petrochemicals will find this book of great interest and value. It will also be of interest to technical research personnel concerned with the development of petrochemical products.

The book is thoroughly up to date, offering a systematic survey of the petrochemical industry. It describes the preparation and important chemical reactions of industrial chemicals made directly or indirectly from petroleum hydrocarbons.

BIOLOGICAL TREATMENT of SEWAGE AND INDUSTRIAL WASTES. Edited by Brother Joseph McCabe, F.S.C. and W. W. Eckenfelder Jr. Published by Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y. 393 pages. $10.00

This book, Vol. 1, on aerobic oxidation, is the first of a series covering the entire field of biological waste treatment. It contains the proceedings of the first conference on biological waste treatment which was held at Manhattan College.

The book covers subjects as basic biochemical principles underlying bio-oxidation and their applications in activated sludge and trickling filter processes; basic theory of oxygen transfer and its application to the design of aeration equipment; and the design and operation of typical sewage and industrial waste treatment processes.

Chemists and sanitary engineers in the mill who are concerned with waste treatment problems will find this book a great help in understanding the theory of bio-oxidation processes and methods used to solve the problems.

PROCESS CONTROL ANALYSIS. By Millard H. Lajoy and E. Allen Baillif. Published by Instruments Publishing Co. Inc. 845 Ridge Ave., Pittsburgh 12, Pa. 58 pages. $2.00.

The authors of this book have based their treatment on simple representation of the closed-loop system in terms of elementary resistance and capacitance elements, which give rise to ordinary, linear differential equations of fairly low order. These defining equations are then solved analytically, giving insight into the analog-computer and stability techniques that conclude the book.

A control engineer or instrument man who wishes to further his knowledge in the field of the frequency response of the closed-loop controlled system, can take his first essential step with the use of this book.

USDA Reports

TECHNICAL NOTES. Issued by the Lake States Forest Experiment Station. Five technical notes are now being issued which include the following subjects: No. 467—Small Local Manufacturers Supply Large Share of Wood Pallets Used in Minneapolis-St. Paul Area, by J. R. Warner; No. 468—Short Cuts in Scaling Converting Stacked Cordwood to Board Feet, by S. R. Gevorkiantz; No. 469—The Break-Even Point for Rough 8-ft. Bolts Merchantable as Sawlogs or Cordwood, by R. A. Ralston; No. 470—Commercial Forest Land in Minnesota Counties by Forest Type, by Alexander M. Vasilevsky; and No. 471—Design of an Experimental Sheet Metal Charcoal Kiln, by Paul H. Lane and G. E. Sprenger.

Manufacturers' Publications

These items are numbered for your convenience. Copies of the publications may be requested at no obligation through our Readers' Service Dept. Use the handy business reply card which accompanies this issue.

Centrifugal Fans. Chicago Blower Corp. This booklet features performance charts and the listing of the latest line of backward curved blade centrifugal fans.
Circle No. 43 on Readers' Service Card

Care and Feeding of Rubber Rolls. Rodney Hunt Machine Co. Basic engineering data is given in report No. 11 published by the company. This report gives information on the maintenance of rubber rolls. It also includes a listing of troubles and treatments of rubber rolls.
Circle No. 44 on Readers' Service Card

Antifoam S-88. Hodag Chemical Corp. A data sheet describing the properties and applications for the company's new Antifoam S-88.
Circle No. 45 on Readers' Service Card

Magi-Key Sheave. Allis-Chalmers. A bulletin on new one- and two-groove "Magi-Key" sheaves for quick and easy speed adjustment of V-belt drives has been introduced by the company. Construction features of the sheave together with hp capacity and dimension tables are all given in the bulletin.
Circle No. 46 on Readers' Service Card

Plastic Pipe Fittings and Valves. American Hard Rubber Co. New Ace Riviclor chemical-resistant plastic pipe, fittings and valves, are fully described in an 8-page bulletin which includes technical properties, a table of resistance to chemicals, data on sizes, pressures, dimensions and prices.
Circle No. 47 on Readers' Service Card

New Acrylic Monomer. Rohm & Haas Co. Technical notes on dimethylaminoethyl methacrylate, now being supplied in pilot plant quantities, are being issued by the company. The uses described in the bulletin are given on fields of paper, ion exchange, etc.
Circle No. 48 on Readers' Service Card

Circuit Protective Devices. General Electric Co. A method of coordinating molded case circuit breakers with current-limiting fuses for protecting low-voltage feeder circuits against fault currents, is described in a new bulletin

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New Literature . . .

issued by the company. The publication describes how the method can be employed, both in planning new systems and in replacing old systems.
Circle No. 49 on Readers' Service Card

How to Handle Expendable Pallets. Signode Steel Strapping Co. The company offers an illustrated chart describing the most efficient methods of handling expendable pallets. This chart can be hung on a wall and used as a safety guide.
Circle No. 50 on Readers' Service Card

Cements. Nukem Products Corp. The company offers five bulletins describing its line of industrial cements. They are: Bulletin 101—Nukem All-Purpose Resinous Cement, for acid solution tanks and for acid-proof floors; Bulletin 102—Nukem Silicate Cement, an acid-proof cement designed for use with acid brick construction; Bulletin 103—Nukem Concrete Primer and Nu-Mastic, an acid-proof liquid designed to prepare concrete surfaces as a primer for Nu-Mastic; Bulletin 104—Nukem Basolit Cements, for use with acid brick and linings in acid tanks; Bulletin 105—Nukem Multibond Cement, for use in acid brick linings in digesters and bleaching tanks and flooring.
Circle No. 51 on Readers' Service Card

Almetal Universal Joints and Drive Shafts. Detroit Bevel Gear Co. An 8-page catalog is being offered by the company showing its complete line of joints and drive shafts. The catalog describes the performance characteristics of the joints and explains the applications in which they are most useful.
Circle No. 52 on Readers' Service Card

Customized Process Control Instrumentation. Fischer & Porter. A 32-page catalog describing the company's products which are available for immediate shipment. The catalog includes prices and covers indicating, recording, controlling, and transmitting instruments for flow, pressure, and density.
Circle No. 53 on Readers' Service Card

Safeguard Rotameters. Schutte & Koerting Co. A new bulletin just released by the company describes the company's line of Series 18200 "Safeguard" Rotameters—instruments for the accurate measurement of fluid rate-of-flow. The bulletin describes the principles and illustrates components common to all such flow measuring instruments.
Circle No. 54 on Readers' Service Card

Physical Properties. Carbide & Carbon Chemicals Co. More than 335 organic chemicals are described in a 24-page booklet just issued by the company. Condensed data on applications are presenteed and physical properties are given in tabular form. The chemicals are arranged by family groups for easy reference.
Circle No. 55 on Readers' Service Card

Hot Air Unlimited. Evans Research & Development Corp. An article on gas chromatography, a new technique rapidly coming into wide use in chemical research, has been published by this company. This article, written by Dr. Donald A. B. Mackay—associate director of research at Evans, traces the historical background, the theory, the practice and the potentialities of this important new addition to the armament of chemical research.
Circle No. 56 on Readers' Service Card

Protective Coatings. Markal Co. Complete information is included on the company's line of proof-protective coatings in a 4-page catalog issued by the company. Coatings are described, along with data on possible application and methods of applications.
Circle No. 57 on Readers' Service Card

Croloy Steel Pipe, Tubing and Welding Fittings. Babcock & Wilcox Co. Engineers involved in the design and construction of equipment employing tubular parts and fittings will be interested in the up-to-date information contained in a bulletin which has been issued by the company. This folder includes technical information on pipes, tubes, and welding fittings.
Circle No. 58 on Readers' Service Card

New Gas Truck Line. Yale & Towne Manufacturing Co. A booklet covering the key features and specifications on trucks from 2000 to 10,000 lb. in capacity. Complete details are also given on special trucks in the Yale lines.
Circle No. 59 on Readers' Service Card

Magamp Sectional Drive for Paper Machines. Westinghouse. A booklet describing the revision in the new design for sectional drives for paper machines. The booklet also includes a guide for estimating power requirements.
Circle No. 60 on Readers' Service Card

New Products. Aceto Chemical Co. Inc. Over 200 fine chemicals, intermediates, and industrial chemicals are listed in a 4-page bulletin published by the company showing the listing of new products now being offered by the company.
Circle No. 61 on Readers' Service Card

Sanitary Liquid End Controlled Volume Pumps. Milton Roy Co. This bulletin describes and illustrates the construction of the sanitary liquid end and the ease with which it is disassembled for thorough cleaning.
Circle No. 62 on Readers' Service Card

Servicing of Ratchet-Drive Lubricators. Bijur Lubricating Corp. Detailed service instructions for an automatic piston pump lubricator are offered in a 2-page service instruction sheet offered by the company. It discusses such things as service, maintenance, operation and starting a new machine.
Circle No. 63 on Readers' Service Card

Machine Knives and Edge Tools. Alcon Production Tool Co. A new catalog describing the company's line of machine knives and edge tools.
Circle No. 64 on Readers' Service Card

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MARKET QUOTATIONS

RAGS (Domestic)

New Cotton Cuttings

The following are brokers' and large dealers' average buying prices for sizeable lots in cents per pound f.o.b. New York:

	per cwt.	
No. 1 white shirt cuttings	13.00—	13.50
Soft unbleached muslins	15.50—	16.00
Fancy shirt cuttings	4.50—	5.00
No. 1 percales	5.50—	6.00
No. 1 washables	2.25—	2.50
No. 1 light silesias	6.50—	7.00
No. 1 light prints	4.75—	5.00
Light flannelettes	6.50—	7.00
Cottonades	2.75—	3.25
Blue overall cuttings	6.75—	7.25
Blue cheviots	6.75—	7.25
Canton flannels, bleached	10.50—	11.00
Canton flannels, unbleached	10.50—	11.00
Osnaburg cuttings	9.50—	10.50
Underwear cuts, bleached	14.50—	15.00
Underwear cuts, unbleached	14.50—	15.00
Sun tan khaki cuttings	5.00—	5.50
American linen cuttings	6.75—	7.25

Cotton Rags

The following are prices, cents per pound, paid by dealers and brokers f.o.b. New York:

	per cwt.	
No. 1 roofing (Chicago)	1.00—	1.05
No. 2 roofing (Chicago)	.60—	.65
Twos and blues, repacked	1.50—	1.75
Thirds and blues, repacked	1.50—	1.75
No. 1 whites, repacked	—	
No. 1 whites, miscellaneous	—	
No. 2 whites, repacked	—	
No. 2 whites, miscellaneous	—	

RAGS (Foreign)

(ex dock New York City)

New Rags

per cwt. — Nominal

- New dark cuttings
- New mixed cuttings
- New light silesias
- Light flannelettes
- Unbleached cuttings
- New white cuttings
- New light oxfords
- New light prints

Old Rags

per cwt. — Nominal

- No. 1 white linens
- No. 2 white linens
- No. 3 white linens
- No. 4 white linens
- No. 1 white cottons
- No. 2 white cottons
- No. 3 white cottons
- No. 4 white cottons
- Extra light prints
- Ordinary light prints
- Medium light prints
- Dutch blue cottons
- French blue cottons
- French blue linens
- Checks and blues
- Linsey garments
- Dark cottons
- Old shopperies

ROPE and BAGGING

F.o.b. and ex dock New York City

Gunny No. 1, domestic	5.50—	6.00
Gunny No. 1, foreign	5.50—	6.00
No. 1 manila rope, domestic	7.75—	8.25
No. 1 manila rope, foreign	6.25—	6.50
New burlap cuts (soft)	6.00—	6.50
Sisal strings	4.25—	4.50
Mixed strings	1.50—	1.75

WASTE PAPER

The following are prices, dollars per net ton, paid by brokers and large dealers for carload quantities of baled stock, f.o.b. cars New York:

No. 1 hard white envelope cuttings	105.00—	115.00
No. 1 hard white shavings	85.00—	90.00
No. 1 soft white shavings	50.00—	55.00
Soft white shavings, uncoated	55.00—	65.00
Fly leaf shavings No. 1	25.00—	30.00
Fly leaf, woody, No. 1	30.00—	35.00
Mixed colored shavings	18.00—	20.00
No. 1 books and magazines	17.00—	18.00
Ledger stock, white, No. 1	50.00—	55.00
Ledger stock, colored, No. 1 (Midwest ship)	35.00—	40.00
New manila envelope cuttings (free of groundwood)	70.00—	75.00
New manila envelope cuttings (containing groundwood)	50.00—	55.00
Manila tab cards	60.00—	70.00
Colored tab cards	45.00—	55.00
New all-kraft envelope cuttings	60.00—	70.00
Triple sorted kraft, 100%	35.00—	
No. 1 old kraft	30.00—	
White news cuts, No. 1	62.50—	67.50
No. 1 overissue news	16.00—	17.00
Folded news, special	14.00—	15.00
Folded news, ordinary	11.00—	12.00
Old corrugated boxes	14.00—	15.00
New jute corrugated cuts	19.00—	20.00
Mill wrappers	14.00—	16.00
Boxboard cuttings	6.00—	7.00
No. 1 mixed paper	6.00—	8.00

CHEMICALS

F.o.b. New York City

Alum, ammonium		
Granular, bags, works, cwt.	4.30—	
Lump, drums, works, cwt	5.05—	
Powdered, drums, works, cwt	5.20—	
1-Arginine, drums, kilo	74.80—	
Blanc Fixe		
Direct process, bags, c.l., works, ton	110.00—	
L. c. l., works, ton	120.00—	
Bleaching Powder, drums, cwt		
Casein, domestic acid precipitated		
Standard, bags, 10,000-lb. lots or more, shipping point, lb	.32—	Nom.
Premium, bags, 10,000-lb. lots or more, shipping point, lb.	.38—	Nom.
China Clay, domestic dry-ground, airfloat, 99%		
325-mesh, bags, c. l., Georgia works, ton	10.00—	
300-mesh, bags, c. l., Georgia works, ton	13.50—	14.50
Imported, white, lump, bulk, c. l., ex dock Phila, Portland, Me., gross ton	20.00—	35.00
Chlorine, liquid		
Tanks, single units, works, freight equaled, cwt	3.15—	
Glycerine, refined (CP, USP) 99%, drums, c. l., delivered lb.	.29⅜—	
Litharge, commercial powdered		
Barrels, c. l., works, freight equaled, lb.	.18	—
Rosin, gum, c. l., f.o.b. New York, cwt		
E	9.35—	
F	9.35—	
G	9.35—	
WW	10.40—	
Rosin, wood, c. l., f.o.b., shipping point, cwt.		
K, M	8.25—	
N	8.30—	
WG	8.60—	
WW	8.90—	
Saltcake, domestic, bulk Works, 100% Na_2SO_4 basis ton	28.00—	
Soda Ash		
Dense, 58%, paper bags, c.l. works, cwt	1.90—	
Light, 58%, paper bags, c. l. works, cwt	1.85—	
Soda, caustic		
Flake, 76%, drums, c. l. works, freight equalled, cwt.	4.70—	
Solid, 76%, drums, c. l. works, cwt.	4.30—	
Sodium Silicate		
40°Be, 1:3, 2, turbid, drums, c. l., works, cwt.	1.55—	
52°Be, turbid, 1:2, 4, drums, c. l., works, cwt.	2.65—	
Starch		
Pearl, 140-lb. bags, cwt.	7.47—	
Pearl, 100-lb. bags, cwt.	7.32—	
Powdered, 100-lb. paper bags, cwt.	7.44—	
Sulfur, crude		
Bulk, c. l. mine, contract, long ton	26.50—	
Talc		
Domestic, bags, c. l. works, ton	33.00—	39.50
Canadian, ground, bags, c. l. works, ton	20.00—	35.00
Titanium Dioxide		
Pigment, calcium-rutile base, regular, bags, c. l., lb.	.09¼—	
High-tinting, drums, c. l., lb.	.09	—
Zinc Oxide Pigment, American process		
Lead-free, bags, c. l., freight allowed, lb.	.14½—	
Leaded, 35%, bags, c. l., freight allowed, lb.	.15½—	

WOOD PULP

Quotations on domestic and Canadian pulp, dollars per short air-dry ton delivered consuming mills including basic allowances, follow:

Bleached sulfite, No. 1	150.00—
Bleached sulfite, Canadian	150.00—
Unbleached sulfite	130.00—
Unbleached sulfite, Canadian	130.00—
Bleached soda	145.00—
Bleached soda, Canadian	145.00—
Kraft, bleached hardwood	150.00—
Kraft, bleached	152.00—155.00
Kraft, bleached southern	155.00—
Kraft, bleached Canadian	155.00—
Kraft, unbleached southern	117.50—122.50
Kraft, unbleached, Far West	125.00—
Kraft, unbleached Canadian eastern	130.00—
Kraft, unbleached Canadian western	120.00—125.00
Kraft, semi-bleached southern	140.00—
Sulfite screenings	72.50—
Sulfate screenings	67.50—

Quotations on imported wood pulp, dollars per short air-dry ton on dock American Atlantic ports, follow:

Bleached sulfite, Swedish, freight allowed	150.00—
Bleached sulfite, Norwegian	—
Bleached sulfite, Norwegian, del'd with limited freight allowance	150.00—
Bleached sulfite, Finish, freight allowed	150.00—
Unbleached sulfite, Swedish, freight allowed	130.00—
Unbleached sulfite, Finnish, freight allowed	130.00—
Kraft, unbleached, Swedish, freight allowed	125.00—
Kraft, unbleached, Finnish, freight allowed	125.00—
Kraft, bleached, Swedish, on dock	155.00—
Kraft, bleached, Norwegian	155.00—

PAPER

Quotations are mill quotations Chicago

Boards (prices per ton, delivered in Chicago, 10 tons or more):	
Plain chip	107.50
News vat lined chip	110.00
.009 chip, rolls	100.00
Filled news	111.50
Solid news	114.50
White vat lined chip	144.50
Chip tube and can stock	112.50
Single manila lined chip	162.50
Single jute lined chip	147.50
Container, 42-lb.	
Kraft liner (per 1000 sq. ft.)	2.68
White patent coated	
.020	175.00
.018	177.50
.016	182.50
Book Paper (f.o.b. Chicago, c.l. cases per cwt):	
No. 1 enamels	19.80
No. 2 enamels	18.80
Machine-coated, 45- to 100-lb.	14.75— 18.40
60-lb. + uncoated offset, 25 × 38 (2000 lb.)	16.55
"A" grade English finish untrimmed, 25 × 38 (2000 lb.)	15.65
Rag Content Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	per cwt
100% rag	63.20
75% "	48.45
50% "	36.95
25% "	31.00
Rag Content Ledger (white, 5000 to 10,000-lb., ream sealed cartons):	
100% rag	64.40
75% "	49.60
50% "	38.10
25% "	32.20
Sulfite Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	
No. 1	21.85
No. 2	21.15
No. 4	19.75
Sulfite Ledger (white, 5000 to 10,000-lb., ream sealed cartons):	
No. 1	23.10
No. 2	22.35
No. 4	20.95
Newsprint (contract base price)	per ton
Rolls, standard	131.00—135.00
Sheets	Standard differentials
Tissues (carlots)	per ream
White No. 1	
White No. 2	
Bleached anti-tarnish	
Colored	
Anti-tarnish kraft	
Manila	
Napkins, semi-crepe (12½ lb. to M shts) per case	
Napkins, full crepe and embossed (12½ lb. to M shts) per case	
Toilet, bleached (M shts) per case	
Toilet, unbleached (M shts) per case	
Wrappings (kraft, basis 50 lb. and heavier)	per cwt
Standard wrapping	9.25
Butchers, counter rolls	10.25
Standard bagging, mill rolls	
Shipping sack, mill rolls	
Gumming, mill rolls	
Asphalting, mill rolls	
Envelope, mill rolls	

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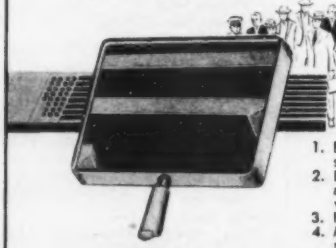

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Mead Pulp Sales, Inc.
Minerals & Chemicals Corp. of America
Moisture Register Co.
Morden Machines Company
Morningstar, Nicol, Inc.
Multiple Corporation
Murray Mfg. Co., D. J.

Nash Engineering Co., The 978
National Aluminate Corp. 1st Cover
National Aniline Division
National Safety Council 1001
Naylor Pipe Company
Nichols Engr. & Research Corp.
Norgren Co., C. A. 935
Northwest Engineering Company 985
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Paper Industry, The 992, 997
Penick & Ford Ltd., Inc.
Photovolt Corporation 997
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Rogers & Co., Samuel C. 986
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St. Regis Paper Co. 954-955
Semet-Solvay Petrochemical Division
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Valley Iron Works Company
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Westinghouse Electric Corporation
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Whiting Corporation
Williams-Gray Company
Wisconsin Wire Works

Yarnall-Waring Company
Youngstown Welding & Engineering Company, The

Professional & Business Service Section
Sirrine Company, J. E. 996

PAPER INDUSTRY

Whither?

... in production, processes, new products, markets

New uses for bark

An economical process for the production of a highly effective soil conditioner has been developed by Armour Research Foundation. The process consists of grinding the bark and treating it with formaldehyde at about 100° C. Under these conditions the tannic acid in the bark forms a condensation product with the added formaldehyde.

The mixture (1) has good ion exchange properties which is an important function in the release of nutrients to the growing plant, (2) keeps the soil open and (3) accepts moisture readily but does not dry out rapidly. Its slow rate of decay has a long-lasting soil conditioning effect. The product should have a good market in American agriculture and should open new opportunities to the pulping industry.

A new moisture meter for paper

The development of a novel moisture meter is reported by J. A. Hart and W. Gallay of The E. B. Eddy Co. The meter operates on the principle of measuring electrical resistance of the paper between two electrodes spaced on the same side of the sheet. An alternating current is used, which obviates the problems of non-uniform contact pressure and static. The meter is said to be remarkably insensitive to basis weight changes and other variations.

Since a 1 per cent moisture change in the sheet results in a 500 per cent change in conductivity, the meter shows exceptionally good accuracy. In a range of moisture contents from 3 — 10 per cent an operating accuracy of ± 0.2 per cent has been obtained consistently.

New use of sodium carboxymethyl-cellulose

Attention is now focused on the use of sodium carboxymethylcellulose in gloss ink printing on paperboard. According to Hercules Powder, the use of CMC can result in 30-45 per cent savings of the gloss ink in printing.

The 1956 output of sodium carboxymethylcellulose was close to 30,000,000 lb.

New deep freeze carton

A new dust- and moisture-proof deep freeze carton has been developed in Sweden. Both carton and the packaging machine used in this connection are registered under the name, "Expresso". The method consists in closing the carton by means of two continuous paper strips.

The carton and machine are designed for the efficient packaging of powdered, granular, and paste or semifluid products.

Soluble-base liquors vs. calcium-base liquor in sulfite pulping

As reported by C. R. Harris of Columbia Cellulose Co. Ltd., soluble-base liquors produce pulps with lower permanganate numbers and higher viscosity permanganate ratios, pulping efficiency factor values, brightness and alpha cellulose contents.

Ammonium- and sodium-base pulps were generally equivalent to each other in these properties and superior to calcium-base pulps, while magnesium-base pulps occupied an intermediary position.

The soluble-base pulps, however, required longer cooking times, of the order of 20 minutes. Ammonium-base pulps showed a slight advantage in cooking time over sodium and magnesium pulps.

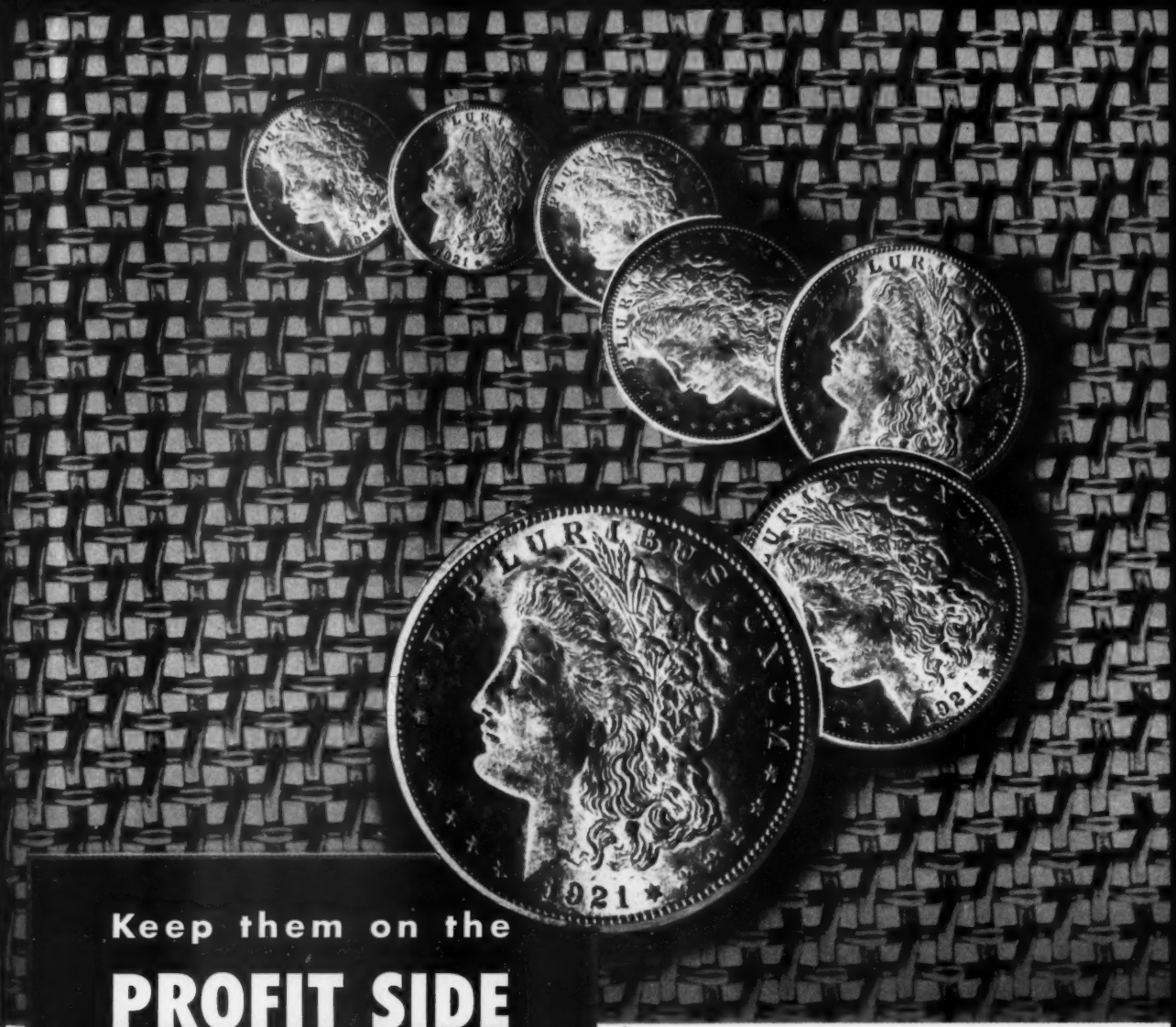

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FIG. LQ600-200
200 lb. S.P.—400 lb. W.O.G.
550° F.

FIG. LQ600-150
150 lb. S.P.—300 lb. W.O.G.

¼ to 2 inches

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